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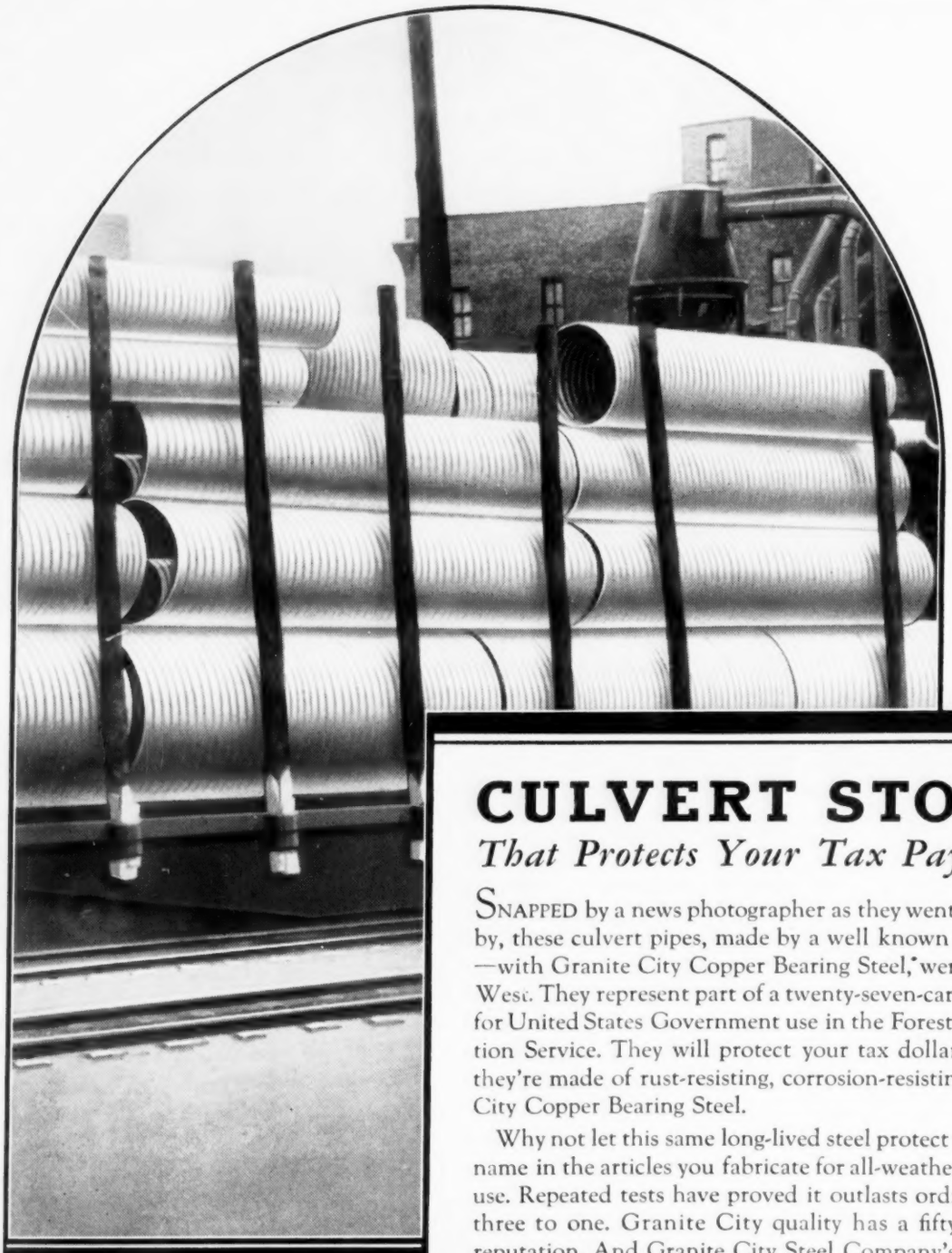

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That Protects Your Tax Payments

SNAPPED by a news photographer as they went rumbling by, these culvert pipes, made by a well known fabricator —with Granite City Copper Bearing Steel, were heading West. They represent part of a twenty-seven-car shipment for United States Government use in the Forest Reclamation Service. They will protect your tax dollars because they're made of rust-resisting, corrosion-resisting Granite City Copper Bearing Steel.

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As the Editor Views the News

PRICES have supplanted labor relations as No. 1 problem of the iron, steel and metalworking industry. For several weeks, scattered developments have pointed toward a significant shift in price psychology. Automobile manufacturers, confronted by a slow up in sales, cut prices moderately and were rewarded by an appreciable gain in orders. NRA, harassed by consumers' protests against price control provisions of codes, announced that its price policy would be modified. Revisions in the steel code, effective June 11, weakened appreciably the influences for price maintenance. The lumber industry slashed prices by 10 per cent. In these and other incidents, one sees evidences of a growing belief that sales volume can be stimulated by price concessions.

• • •

Will Prices Affect Wages?

In view of this background of events, the filing last Thursday of lower prices on certain finished steel products should not have been totally unexpected. That it did occasion surprise in many quarters was due largely to the the fact that executive personnel has been preoccupied with labor problems. The new prices, effective July 7 (p. 49), while slightly lower than the quotations originally filed for third quarter, still remain a shade higher than second quarter prices. Should the movement toward price concessions gain much more momentum during the next few months, the question of wage maintenance is certain to become involved.

• • •

Disputes Go To Neutral Board

Efficacy of the new labor disputes act, hastily thrown together at the eleventh-hour as a substitute for the Wagner bill, will be tested in the steel industry. On Thursday the President under the authority of this act, appointed a neutral board of three (p. 10), which presumably will act upon the various problems of collective bargaining which have provoked discord since the advent of section 7A of NIRA. Acceptance of this board by both sides acts automatically to hold the Amalgamated to its pledge of June 16 to call off the threatened strike. The success of the board's effort will depend largely upon the attitude of the government. If NRA continues to favor professional unions at the expense of representation plans, the board can do little to effect a permanent settlement. Professional labor union leaders ask that representation plans be banished, and, unfortunately there are influential persons in Washington who do not understand the unfairness of this attitude. The steel industry will be obliged to oppose these forces for a long time to come. The issue may arise in the next congress. It will be a long, drawn out contest.

• • •

How Dangerous Is Work in Steel?

Few laymen know much about actual conditions in the steel industry. The average person probably thinks that employment in the mills and furnaces is extremely hazardous. He acquires this opinion largely from lurid articles in newspapers of the sensational type. An eastern metropolitan sheet last week published articles (p. 20) which grossly exaggerated the dangers of work in iron and steel plants. The steel industry should acquaint the public with the truth about the hazards of employment. The frequency of injuries in the steel industry actually is less than that among civilian U. S. government employes. We cannot stress too strongly the need for the dissemination of "The Truth About Industry" to the American public.

• • •

Incentives for Rehabilitation

During the past few years, many changes have been proposed or made in boiler codes. The influence of these revisions upon methods and equipment employed in fabricating shops (p. 23) has been marked. Manufacturers and users of pressure vessels will do well to watch the refinement of codes in this field where progress has been particularly rapid. . . An open-hearth authority (p. 18) declares that the code ban on new furnace construction is a "blessing in disguise" in that it stimulates repair and improvement. To this might be added the observation that higher costs, as for instance higher royalties (p. 12), and lower selling prices, are equally potent stimulants for equipment rehabilitation.

E. L. Shaner

Labor Board Can Mediate But Not Force Arbitration

WASHINGTON

FOR all practical purposes, control of labor policies of the iron and steel industry passed, June 28, to the national steel labor relations board appointed by the President.

Functions of the board are to consider and determine cases of alleged violation of section 7a of the recovery act, mediate in labor questions, serve as a board of voluntary arbitration, and conduct secret elections for the choice of representatives for collective bargaining.

Created under the joint resolution of congress, passed June 16 and approved by the President June 19, the board has wide powers, though falling short of demands of organized labor which culminated in the 4-point program which averted the steel strike scheduled for June 16.

Arbitration Voluntary

To mediate is to attempt to bring together two disagreeing factors. Arbitration, whereby a decision binding on both parties is made, is only voluntary under this new setup for the steel industry, and may prove a decisive protection for it.

On this board the President placed Judge Walter P. Stacy, of Wilmington, N. C., who is chairman by executive order; retired Admiral H. A. Wiley, of Washington, and Dr. James A. Mullenbach, of Chicago.

While nominally independent, the board will maintain a close contact with Secretary of Labor Perkins and through her report to the President.

Designed to be impartial, the steel board is the second of its kind named by the President, the first being appointed for the longshoremen strike on the Pacific coast.

First meeting of the board was held at noon June 29 in Washington with Miss Perkins. A second meeting was held later in the day, presumably to determine procedure. Following these conferences, Judge Stacy said nothing definite had yet been decided concerning its activities.

Apparently, the board starts out with a clean slate. An impartial board was agreed to by representatives of the steel industry on June 14. Such a board was demanded by the Amalgamated Association of Iron, Steel and Tin Workers on June 15.

But accompanying its proposal for a board, the Amalgamated set up a 4-point program, most important of which to the industry was the demand for majority representation, to which the industry is believed to be opposed.

The Amalgamated's program was formally placed before Miss Perkins, who in turn transmitted it to the American Iron and Steel institute. The only action of the institute has been to acknowledge receipt of it.

Acme Photo

SHE HAS THE LAST WORD: Miss Frances Perkins, secretary of labor under President Roosevelt and first woman in the cabinet, to whom the newly-appointed steel labor relations board will report

Presumably, the initiative for action rests with organized labor. So far as the industry is concerned, the 90 per cent participation of its employes in recent elections under company plans is conclusive. The Amalgamated, however, may be expected to demand elections, and the board will be acting in conformance with recent Washington policy if it orders them.

According to Miss Perkins, naming of the board was agreeable both to the Amalgamated and the institute.

While the new board appears to have the approval of M. F. Tighe, president of the Amalgamated, and to meet the specifications adopted by the Amalgamated at Pittsburgh June 15, following the ultimatum by William Green, president of the American Federation of Labor, that the steel strike scheduled for June 16 be abandoned, radicals are not appeased.

Wave Threats at Capitol

An 11-point proposal was submitted to the department of labor last week by the steel and metalworkers' union, a left-wing group claiming to represent 15,000 members. Only the pressure of a strike "can seure from the steel companies the economic demands and recognition of the unions chosen by the workers," this group declared to Thomas Eliot, assistant solicitor of the department of labor, representing Miss Perkins.

In the South, the back of the strike of iron miners was broken when the Tennessee Coal, Iron & Railroad Co., a Steel Corp. subsidiary, continued the base price of 30 cents an hour but granted skilled labor an advance of three to five cents per hour.

In the North, conditions in mill towns were generally quiet, except for the charge of William J. Long, president of the Weirton lodge of the Amalgamated, that Amalgamated organizers are being harassed.

An unusual demonstration of loyalty of an employes representation plan was a telegram dispatched last week to Miss Perkins by a committee from the Cuyahoga works in Cleveland of the American Steel & Wire Co. This telegram requested Miss Perkins to grant to employe representatives the same consideration accorded officials of the Amalgamated and claimed that less than 10 per cent of the steel workers of the country belong to the Amalgamated.

The claims of the Iron and Steel institute that 193,362, or 90.12 per cent of the 214,561 employes eligible to vote in recent elections for representatives for collective bargaining under employe representation plans took advantage of their opportunity, evoked from Mr. Green a caus-

tic rejoinder that "if the returns of the workers' elections are correct, a perfect state of satisfaction prevails among the workers employed in the steel industry."

Postpone Wage Conference

On Friday the sheet and tin mill wage conference, which opened Wednesday in Pittsburgh between the Amalgamated and the Western Sheet and Tin Plate Manufacturers association, was called off until July 10. So many details of demands made by the Amalgamated at its April convention remain to the ironed out that there was not sufficient time in which to reach an agreement by June 30.

Friday night the Steel City lodge of the Amalgamated met in Youngstown, O., to consider an open-hearth and bar mill wage scale. Open-hearth and sheet mill wage schedules will be discussed at a preliminary session of the sixth district meeting scheduled to be held in Mansfield, O., July 8.

Labor

AMERICAN IRON AND STEEL INSTITUTE reports payrolls in May reached a new post-depression high at $51,895,931, an increase of $6,424,053 over April, with 18,276 more persons employed during May or a total of 449,362.

Workers paid on an hourly, piecework or tonnage basis increased 17,629 to 409,698. This is slightly more than 97 per cent of the total employed at the 1929 peak, and 104,459 more than were employed in the same period last year. Total wages for this group increased during May 16.6 per cent to $42,916,172.

Average hourly wage per worker during May was 64.6 cents, compared with 47.3 cents in June last year. Average hours per week for each wage earner in May were 36.6, against 33.7 in April, and 39.4 in June, 1933.

Average hours per week for all employes, including those on a salary basis, were 37.1, and average hourly wage rate was 70.3 cents, making the average weekly income for all employes $26.08. The total of hours worked by wage earners in May was 66,450,593 and in April, 56,723,813.

¶Total man-hours worked in manufacturing industries in May was 0.8 per cent less than in April, but total number of persons at work increased 1.1 per cent and payroll disbursements gained 0.2 per cent, according to the National Industrial Conference board, New York. Average hourly earnings were 58.7 cents in May, compared with 57.9 in April. Average weekly hours declined from 36.1 in April to 35.4 in May.

¶Bureau of labor statistics report shows factory employment increasing 0.1 per cent in May, but payrolls declined 0.3 per cent, compared with April. On the basis of 1923-1925 equalling 100, employment at blast furnaces, steelworks and rolling mills in May was 76.8, compared with 72.9 in April, and 49.8 in May, 1933. Pay-

Members of National Steel Labor Board Created by President

International Photo

ADMIRAL HENRY A. WILEY, retired, was born in Troy, Ala., Jan. 31, 1867, graduated from the Naval academy in 1888, serving in the Spanish-American war and coming ashore 1909-12 to serve in the bureau of navigation of the navy department. Member of many navy boards from 1909 to 1915, he went to sea in 1916 as commander of the NEW JERSEY, *was made temporary rear admiral in 1918, commanded destroyers of the Pacific fleet in 1919-20, was elevated to vice admiral in 1923, served on the general board 1925-1927, and became commander of the fleet with the rank of admiral in November, 1927, and since retired.*

Associated Press Photo

JUDGE WALTER P. STACY was born in Ansonville, N. C., Dec. 26, 1884, being graduated from the University of North Carolina in 1908 and receiving his doctor's degree in 1923. He began practicing law at Wilmington, N. C., in 1910, became a member of the state house of representatives in 1915, was judge of the superior court 1916-1920, was elected associate justice of the supreme court of North Carolina for the term 1921-1928, and in 1926 he was re-elected for a term of eight years. On March 16, 1925, he was appointed chief justice of the supreme court. He maintains his residence in Wilmington.

DR. JAMES A. MULLENBACH, since December a member of the labor policy board of the oil industry, has had a long career in labor, educational and charitable affairs in Chicago. From 1904 to 1909 he was superintendent of municipal lodging houses; for two years was general superintendent of the United Charities; he helped arbitrate a garment workers strike in 1911; in 1913 he was made superintendent of the Cook county infirmary. Entering private work, he was long chairman of the joint trade board of Hart, Schaffner & Marx. Last August he was made labor arbitrator for NRA in the Chicago district.

rolls for the same group and on the same basis had an index of 66.1 in May, against 59.4 in April, and 27.8 in May, 1933.

¶On the basis of average prices in 1923 equalling 100, the cost of living of industrial wage earners in May was 78.6, compared with 78.4 in April. This was an increase of 9 per cent over May, 1933, but a decline of 20 per cent from May, 1929, states the National Industrial Conference board, New York.

New Capacity

MACKINTOSH-HEMPHILL CO., Pittsburgh, has been awarded the contract for a new type roughing mill, 32 x 20 x 48 inches in size, for the Tata Iron & Steel Co. Ltd., Jamshedpur, India, through the Perin Engineering Co., New York. The order, valued at $100,000, is part of an expenditure of $250,000 by the Tata company for modernization.

The roughing mill will be of the full automatic type with electric controls and wing tables equipped with antifriction bearings. Existing mill drives will be used on the new equipment, which is of the high-speed type.

The Tata company has five blast furnaces, seven 60-ton basic open hearths, 200 Wilputte coke ovens, a 40-inch blooming mill, 28-inch rail mill, and one 16 and two 10-inch bar mills.

Transportation

A PROTEST to the interstate commerce commission, objecting to any increase in the less-than-carload railroad freight rate on iron and steel shipments from Chicago to points in the western trunk line territory has been filed by the Chicago association of commerce. This action follows the filing of a case before the commission by certain western trunk line iron and steel distributors.

A conference was held in Chicago June 28 between members of the Central Freight association and various bodies representing certain steel fabricators for the purpose of discussing proposed revisions in fabricated-in-transit provisions as related to iron and steel freight rates. This was a closed conference and is to be followed by an open hearing later.

Financial

ISAAC M. SCOTT, retired president of Wheeling Steel Corp., and Garrett B. Le Van, of Steubenville, O., were appointed ancillary receivers for Follansbee Bros. Co. Inc., in the federal district court of Columbus, O., June 26. Original receivership action was instituted in Pittsburgh six weeks ago when John Follansbee, president of the Follansbee company, and George T. Ladd, president of the United Engineering & Foundry Co., were named co-receivers.

¶Federal district court at Pittsburgh will hold a hearing July 12 to determine whether trustees of the Pressed Steel Car Co., Pittsburgh, shall be made permanent. Recently the company petitioned for permission to reorganize under the new federal bankruptcy act. Trustees are F. N. Hoffstot, George D. Wick, and Walter A. Bonitz. Last week these trustees were authorized to expend $12,486 on taxes owed by the Pressed Steel Car Co.'s plant at Hedgewisch, Ill., and $10,275 to meet interest payment on bonds of the subsidiary, Illinois Car & Equipment Co.

A Worm-Water Quench!

TO RENDER iron unusually hard, distill water from radishes and maw worms. Extinguish the iron in this water twice or thrice, and gems can be cut with it."

This was the formula of Paracelsus, a Swiss born in 1493, whose work on iron both as a metal and a medicine is related in the March issue of The Reading Puddle Ball, published by the Reading Iron Co., Reading, Pa.

In separating and isolating the elements, Paracelsus, who discovered zinc, calomel and other distillations, leaned heavily on iron ore and iron filings. Their magnetic properties were the foundation of his medical system. But Pliny, the Roman author, long before had discovered medicinal properties in iron.

"Iron has the effect of uniting wounds and is possessed of certain desiccative and stringent properties. Diluted in wine, and kneaded with myrrh, it is applied to recent wounds, and, with vinegar, to swellings. Employed in the form of a liniment it alleviates gout."

Foreign

THIS is a favorable time for American manufacturers of machine tools to make contracts in France for the sale of manufacturing licenses, Lestrade Brown, assistant trade commissioner in Paris, has reported to R. E. W. Harrison, chief of the machinery and agricultural implements division of the department of commerce. At present the French machine tool industry is operating at 30 per cent of normal and while the French government is helping the industry in every way possible, certain types of machines, especially for the automotive industry, still cannot be had in France.

¶Gremany's foreign trade in machinery in 1933 is reported by Rolland Welch, assistant trade commissioner in Berlin, to the bureau of foreign and domestic commerce, Washington, as follows: Imports, 16,963 metric tons valued at 39,907,000 reichsmarks, compared with 15,991 tons valued at 46,549,000 marks in 1932; export at 321,591 tons valued at 542,787,000 marks, against 432,467 tons valued at 749,686,000 marks in 1932.

Production

REFLECTING completion of shipment of second quarter contracts and a slackening of tension in the labor situation, the steelworks operating rate broke 13 points last week to 46 per cent, lowest since the third week of February. This week a further decline is certain, owing to the Independence day holiday, but much of the reduction was accounted for last week. Details by districts follow:

Pittsburgh—Declined 16 points last week to 40 per cent. Open-hearth schedules have been cut by 50 per cent in ten days in this district.

Six fewer blast furnaces were producing pig iron in the district last week, with 20 out of 60 numbered active, against 26 out of 60 active a week ago. Jones & Laughlin Steel Corp. banked two furnaces, one at

(*Please turn to Page* 65)

Holds Up Royalty Advance On Stainless Steels

Increases in royalty which the Chemical Foundation, New York, was to have imposed on its licensees to the production of stainless steel, effective July 1, are being held in abeyance, it is understood. Objections to the increases, placed before the foundation by a committee representing the licensees, are said to be responsible for holding up the advance.

Licensees were notified on May 31 that the royalty of 1 per cent of the net selling price of the licensed product would be advanced to 5 per cent on finished and semifinished products, and in the case of castings the 1 per cent would be replaced with a royalty of 2 cents per pound on the net weight of finished form castings molded in sand.

In computing royalties, no deductions were to be allowed for selling or other expense, commissions discounts, allowances, and the like.

A further stipulation was that on and after July 1 ingots and semifinished products were not to be sold to rolling mills or other converters or fabricators for making finished products unless the purchaser were licensed by the Chemical Foundation.

A schedule of base prices on various grades of stainless steel was established by the foundation.

MIRRORS OF MOTORDOM

DETROIT

ONE thing the automobile industry has found out this year is the elastic limits of the American people's pocketbook.

As delicately adjusted as the finest pair of scales, the balance between automobile prices, production and sales was a three-cornered affair which the industry toyed with this spring almost to its undoing.

First, the industry rediscovered the economic law that raising prices forces production down. Then it learned the converse that lowering prices lifts production up.

Hence, the industry stands on the threshhold of July and sees schedules actually greater than June production, which is something rarely witnessed in any July.

Chevrolet's program is a cross section of the low-price car industry. In June it assembled 88,000 cars. The tentative schedule for July was 73,000, but, sensitive to the demand which reduced prices have helped create, 92,000 units are now scheduled for this month. Last week 23,800 units were assembled, an increase of 5000 over the week ended June 23.

Holiday Shutdowns Cut Rate

Were it not for a plant holiday from June 29 to July 9, Ford would have assembled fully 100,000 cars this month, or 15,000 more than in June. This June 29-July 9 shutdown, at Hudson-Terraplane as well as Ford, is for inventory, checkups and some plant changes.

Ford last week increased almost as much as Chevrolet, going from 21,485 units in the week ended June 23 to 25,350 in the week ended June 30. Ford, incidentally, may use the June 29-July 9 shutdown as a substitute for the usual holiday around Labor day.

Other increases last week were Graham 100 to a total of 420, Hupp 20 to 290, Plymouth 4525 to 12,850. Buick was unchanged at 2500, Olds at 3000, Pontiac at 1250, Nash at 1500, Auburn at 175 and Reo at 500.

Slight reductions were made by Dodge, going down 500 to 2700, Hudson-Terraplane off 350 to 1830 and Chrysler down 100 to 700. Studebaker was off sharply to 950 as it had stocked dealers on new models.

For all makers, assemblies last week reached slightly over 80,000, highest since the first week of May.

In a measure, an upward revision of July schedules has occurred in many plants in the Detroit area and it seems safe to predict at this time that July assemblies will equal those of June.

Such expectation makes the industry exceptionally cautious. Any improvement in July is contra-seasonal, as not since 1925 has any July bettered the preceding June. Also, this improved outlook for July is the direct result of a "shot in the arm" in the form of price cutting, and this is a stimulant that eventually wears off.

Production executives are on the spot, as a result. Floats of parts have been permitted to run down in anticipation of a slack July and August and these must now be built up. If the present improvement is only a flash in the pan, then an excessive inventory of new cars may be built up, and in Detroit it is more of a crime to overshoot than undershoot the mark.

On June 20 Ford assembled the 1,000,000th of the V-8 series which it immediately dispatched for display at the Century of Progress in Chicago. The first Ford V-8 was assembled at the Rouge plant on March 9, 1932.

Sometime in July the 22,000,000th Ford will come off the Rouge assembly line. The 20,000,000th was assembled on April 14, 1931, the 15,000,000th on May 25, 1927, and the 10,000,000th on July 4, 1924.

Only 28,618 Ford cars had been built up to 1908. From 1908 to 1927, 15,443,313 model T's were made. Model A, introduced late in 1927, had a production of 4,527,069 before it was supplanted by the V-8.

Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

	1932	1933	1934
January	119,344	130,087	156,907
February	117,418	106,888	231,707
March	118,959	118,002	331,263
April	148,326	180,713	354,745
May	184,295	218,347	331,641
June	183,106	253,387	.....

Estimated by *Cram's Reports*

Week ended	
June 2	54,185
June 9	69,107
June 16	71,293
June 23	70,330
June 30	80,936

Graham in Low-Price Field?

Graham is tired looking at the growing volume of low-priced car sales and last week was on the brink of plunging head-on into the swim.

An option to buy all of the physical and intangible assets of Continental's lowest priced of its three models was renewed by Graham at mid-week with the plan of moving most of the equipment into Graham's own plants.

Continental's Detroit operations gradually have been crowded out by leases to outside concerns, chiefly Chrysler, and what activities Continental has retained are being moved to its Muskegon, Mich., division.

Graham, at any rate, had the Continental engine on the block last

week testing for possible motor changes it would have to make. Plans were being sketchily drawn for jig, fixture and tool changes, as well as revision in body dies.

If Graham closes on the purchase of the small Continental, as matters are promising enough that it will, another entry in the $600-$700 price range is assured. Graham visualizes a market for 25,000 of these cars in the coming year, but for the time being will buy soon for an initial lot of 5000.

Perhaps Graham can succeed where Continental fell by the wayside, though the chief fault with the latter was the small dealer commission allowed—$35 per car—which made few dealers want the selling account.

Still Want 10 Off on Parts

That ever-present bugaboo—the costs problem—is still way up front in Detroit's automotive discussions today. How to carry or spread the bill for recent price reductions is still the worry of automobile manufacturers.

How to counter their request for a 10 per cent slash in parts' contracts is the concern of the partsmaking group. So far the tug of war is a stalemate.

In fact, as late as last week—this, even though STEEL first reported two weeks ago that 10 per cent cuts in parts were being asked—some of the motor makers were still joining in the proposition. One, whose circular letter for 10 per cent cut was sent out under date of June 22, has not reduced the price of its models.

Partsmakers contend there is not, on the whole, a 10 per cent profit in manufacturing parts. They also report that they can gain no leeway with their problem when carried to steel or other material prices, let alone touchy labor rates.

Obviously in a hole, they have tried to explain that they cannot shave their prices. However, now that three weeks have passed and the automobile manufacturers have not pressed their first demand harder home, some of the more shrewd suppliers say the move was only a feeler that was dropped when no one capitulated.

Of the entire General Motors line, Pontiac is the farthest along in preparations for its 1935 models.

Pontiac's new car will be an entirely new 6-cylinder motor and many of the present parts are undergoing major size and appearance revisions. Practically all body die work has been sublet and a majority of the latter is nearing completion. A novelty in fender skirting is promised.

Expenditures by Pontiac for new milling machines, grinders, and other heavy prices of equipment have run up well into six figures. Bore, stroke and engine design is to be entirely revised and the present Pontiac eight—which is the former Oakland—is definitely to be dropped next year.

In appearance Pontiac will try as much as possible to divorce itself from the mark of Chevrolet. Perhaps the greatest handicap Pontiac has had this year is the news, by now well spread, that many of the Pontiac parts are made in Chevrolet plants.

Then, in addition, Buick's 40, of which some 400 a day were still being turned out last week and of which some 17,000 have been sold just since introduction on June 12, cut a wide swath through Pontiac's field.

General Motors will groom Pontiac for next year as a thrust at that price range just above Chevrolet, but in turn will make Pontiac so distinctive as to assure its success.

At Pontiac, though these extensive changes be under way, no nearby presentation to the public is planned. Last week work on some of the retooling was temporarily held up, probably to proceed more evenly on all rearrangements.

Material purchases, and this includes steel to the new specifications, will not be ready for bids before another 60 days. But, extensive plant and equipment revisions at Pontiac forecast this car for a 1935 novelty.

Here and There In Industry

AUSTIN MFG. CO., Harvey, Ill., and Western Wheeled Scraper Co., Aurora, Ill., have consolidated to form the Western-Austin Co. with main offices at Aurora. Officers of the new company are: President, S. F. Beatty; chairman, C. W. Sencenbaugh; vice president, H. B. Bushnell; vice president, K. N. Forbes; vice president, F. L. Jerome; vice president, H. M. Kleiser; secretary, J. L. McNab; treasurer, McClure Kelley.

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Harrisburg Pipe & Pipe Bending Co., Harrisburg, Pa., has opened a branch office at 1503 Hunt building, Tulsa, Okla., in charge of O. C. Thomas.

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Arthur J. O'Leary & Son Co., Chicago, manufacturer of iron and steel products, is celebrating this year the sixtieth anniversary of its establishment in 1874.

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Steel Sales Corp., 129 South Jefferson street, Chicago, has opened a steel warehouse at 4150 St. James street, Detroit, where it has about 40,000 square feet of space. F. W. Walters, vice president, is in charge of this warehouse and sales in the Detroit district.

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Cooley Electric Furnace Co., Indianapolis, has appointed Case Hardening Service Co., 2281 Scranton road, Cleveland, its representative in that territory.

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Machine Tool & Supply Co., Tulsa, Okla., has been appointed Oklahoma distributor for John A. Roebling's Sons Co., Trenton, N. J., manufacturer of wire rope and cable.

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H. A. Brassert & Co., Chicago, has taken an order from the Bethlehem Steel Co. for a new high efficiency hot blast stove to be erected at F furnace, Lackawanna, N. Y.

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Bridgeport Machine Co., Wichita, Kans., will warehouse and distribute products of the American Steel & Wire Co., Cleveland, through its various stores in the Mid-Continent and Gulf Coast oil fields.

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Tanner & Co., 409 South Pennsylvania street, Indianapolis, wholesale dealer in tinners' supplies, sheet steel and other metal products has added a stock of hot-rolled and cold-rolled bars and steel shapes.

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Sampsell Mastoker Co., Lafayette, Ind., manufacturer of industrial and domestic stokers, is increasing production and has established outlets at Chicago, Pittsburgh, Louisville and other cutters, utilizing jobbers in addition to its sales direct to users.

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Link-Belt Co., 910 South Michigan avenue, Chicago, has opened a warehouse at 413 Second avenue, Dallas, Tex., in charge of E. G. Wendell. Stocks will be carried of Caldwell and Link-Belt conveying and power transmitting machinery.

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American Steel & Wire Co., 208 South LaSalle street, Chicago, has been appointed national distributor for the Smith metal laced joint for concrete highways, manufactured by A. O. Smith Corp., Milwaukee. This device was described in STEEL March 19, 1934, p. 40.

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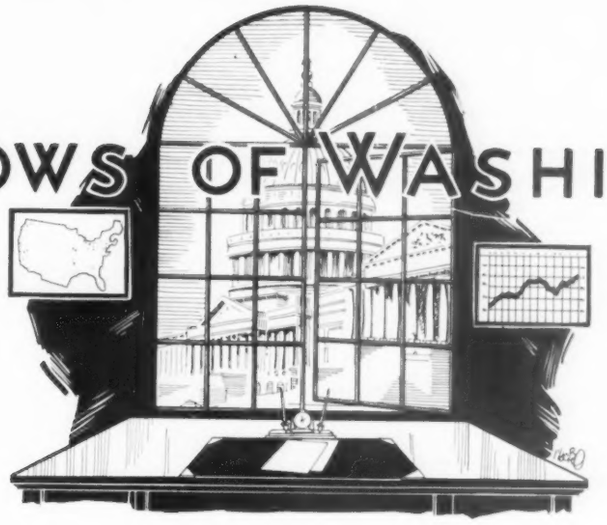
Railway Steel-Spring Co., a wholly-owned subsidiary of the American Locomotive Co., 30 Church street, New York, has been consolidated with the parent company and will be known as the railway steel-spring division of the American Locomotive Co. The consolidation turned over to the American Locomotive Co. the manufacturing plants, sales orders and contracts and entire personnel of the Railway Steel-Spring Co. The change will cause no interruption in service.

WINDOWS OF WASHINGTON



WASHINGTON

IN THAT period which some even now quaintly refer to as "the good old days" the adjournment of congress was a heartening signal to business. All legislative hazards were behind it, and with reasonable accuracy it could chart its course for some months ahead.

The new deal has changed that, too. Legislative uncertainty merely becomes administrative uncertainty. So much recent legislation is permissive, so many powers of congress have been transferred to the executive side of the government, that conditions can change even more rapidly than when congress was sitting.

For example, the labor situation in all industry—and steel particularly at the moment—hangs precariously between the new presidential boards aud the lady secretary of labor. Under this setup organized labor can't lose and might win, hence the premium on trouble.

Shoals Ahead in Business Sea

Ahead of the stock market, which is so vital to the durable goods industries, is the administration of the new securities exchange control act—again the matter of a board. Incidentally, the Roosevelt administration is laying itself open to as much disparagement on boards as the Hoover regime did on commissions.

The South will be kept churned up until the administrative aspects of the Bankhead cotton control act are cleared up, and the South is a heavy buyer of galvanized sheets, among other steel products.

Government loans to business through RFC; silver; reciprocal tariffs (likely to affect steel only in triangular trading); the decline of NRA and the possibility that all price control provisions of codes may be eliminated—these are only a few of the contingencies against which business must brace itself this summer, even though congress has disbanded.

Too, up and down the land will go all representatives and a third of the senators, attempting to build up their fences preparatory to the elections Nov. 6. The new dealers will become more vocal than ever, chiefly on the defensive, and the G.O.P. once more will be the official opposition.

Confidence Will Conquer All

It does indeed look like a hectic summer, and yet business will survive all the confusion provided it can gain only one factor—confidence. For proof, go back to the spring of 1933. March, when all the banks were closed and the situation seemed blackest, saw steel ingot production down to 33,699 tons a day, barely higher than the depression-low of 31,360 tons in August, 1932.

Yet, the conviction that the worst had been seen, that any change must be on the side of improvement, upped steel production so rapidly that by July, 1933, the daily rate had been increased 280 per cent to 128,152 tons. No more phenomenal recovery has ever been staged by any major industry.

In this period congress was wallowing under the initial impact of the new deal, the brain trust was emanating bright ideas daily, NRA was being delivered by means of a Caesarian operation—but there was a spirit which was born of confidence.

Right now there are many minds in Washington of the opinion that the stage can be set for a fall recovery of tremendous proportions if the President will give some assurances, especially concerning the currency. Just a word that would dissipate doubts concerning long-term contracts would release business and make any adjustment in labor and tariffs appear only so many incidents.

At the moment only the railroads are affected directly by the new law creating the machinery for pensioning elderly railroad workers, but out of this experiment is likely to come a pattern for industry in general.

The new deal is definitely committed to old-age pensions. The program adopted at the recent meeting of Republican party executives in Chicago included retirement pensions. Ogden L. Mills, former secretary of the treasury and probably the foremost Republican in public life today, has long been an advocate of such a plank in the Republican platform.

No force in Washington is so strong for old-age and unemployment allowances as Secretary of Labor Perkins. For a year she has bided her time, has seen NRA Administrator Johnson and Senator Wagner handle labor matters rightly belonging to her department, and now she is coming into her own.

Ardent as she may be for unionization and collective bargaining, her viewpoint on labor is the social one. Indeed, that is why the American Federation of Labor opposed her from the start. Better restrooms for women, more factory comforts and safety for men—these are paramount in her mind, and they offer a bargaining basis for industrial executives who will have to deal with her in the new labor board setup.

Employers $2 for Workers' $1

Under the railroad retirement act, annuities are to be paid all workers attaining age 65 or completing 30 years of service. These annuities will be paid from a fund to which workers contribute 2 per cent of their "active service pay," and the railroads twice as much.

Over the period of employment, a workers' monthly pay is to be averaged, and the annuity based upon this computation: 2 per cent of the first $50, 1½ per cent of the next $100, 1 per cent on the remainder, all this multiplied by the number of years.

Apply this to a steel worker who has completed 30 years in a mill and has averaged $160 a month over this period. Two per cent of $50 equals $1; 1½ per cent of $100 equals $1.50; 1 per cent of $10 equals 10 cents—a total of $2.60. Multiply

this by 30 and the monthly annuity is $78.

In case this steel worker retired after 30 years of service but before he was 65 years old, he would lose 1/15th of his annuity for every year he was under 65 In other words, if he was only 63 years old he would receive 13/15ths of $78.

Another contingency that has been provided for is the demise of this worker in event he dies before he has drawn out all that he contributed. In this case, his heirs would receive the unpaid balance plus 3 per cent compound interest.

It is noteworthy that the funds contributed by workers and employers will be handled by a bureau at Washington—a new bureau—and will be invested in government bonds. It is estimated that the additional outlay per year for the railroads will be $60,000,000, and 1,000,000 workers will be affected.

In 1933 the total payroll of the United States Steel Corp. was $163,149,503. Had such a program been in effect for the steel industry, the contribution of Corporation employes last year to a retirement fund would have been $3,262,000 and that of the corporation itself $6,524,000. This figures out to a total of practically $10,000,000, equal to $1.21 for every ton of ingots produced by the Corporation.

How Steel Plants Would Pay

If it may be assumed that the payrolls of other producers of steel last year were in the same ratio to the Corporation's payroll as their capacities indicate, then the drain would have been:

	From employes	From the company
Bethlehem Steel Corp.	$1,090,000	$2,180,000
Republic Steel Corp.	586,500	1,173,000
Jones & Laughlin Steel Corp.	425,000	850,000
Youngstown Sheet & Tube Co.	359,000	718,000
National Steel Corp.	261,000	522,000
American Rolling Mill Co.	261,000	522,000
Inland Steel Co.	228,000	456,000
Wheeling Steel Corp.	163,000	326,000
Crucible Steel Co. of America	122,000	244,000
Otis Steel Co.	98,000	196,000
Pittsburgh Steel Co	85,000	170,000
Lukens Steel Co.	65,000	130,000
Allegheny Steel Co.	55,500	111,000
Sharon Steel Hoop Co.	52,000	104,000
Gulf States Steel Co.	45,500	91,000
Granite City Steel Co.	42,500	85,000
Continental Steel Co.	32,500	65,000
Midvale Co.	30,500	61,000
Laclede Steel Co.	30,000	60,000
Wickwire Spencer Steel Co.	18,000	36,000
Scullin Steel Co.	14,000	28,000
Follansbee Bros. Co.	10,800	21,600
Vanadium Alloys Steel Co.	7,200	14,400
Ludlum Steel Co.	4,575	9,150

At press time Friday evening it was said at the White House that the President had taken action on this measure. In event this action is a veto, it may be assumed that labor forces will fight for the measure at the next session of congress, and that the foregoing is a pattern for the future.

Ressler Heads Warehouse Group

HAROLD B. RESSLER, vice president of Joseph T. Ryerson & Sons Inc., who in February was placed in charge of eastern activities of the company at its Jersey City, N. J., plant, was elected president of the American Steel Warehouse association at its twenty-fifth annual convention in New York, June 27. Vice president of the association the past year, Mr. Ressler succeeds C. C. Dodge, of George F. Blake Inc., Worcester, Mass.

Lester Brion, of Peter A. Frasse & Co., New York, was elected first vice president, and J. Frederick Rogers, of Beals, McCarthy & Rogers Inc., Buffalo, was chosen second vice president. On Oct. 31, George A. Fernley, of Philadelphia, will retire as counselor, and B. R. Sackett as secretary-treasurer.

Harold B. Ressler

Before the end of the year a program of small quantity extras for mill shipments of steel products will be adopted, according to Guy P. Bible, Philadelphia, and some of the inroads of mills into warehouse business as a result of the steel code will be checked.

Ralph J. Stayman, manager of warehouses for the Jones & Laughlin Steel Corp., Pittsburgh, as chairman of the committee on cutting extras, reported that the new schedule is ready for submission shortly to members of the association.

Cost-of-doing-business statistics submitted by A. L. Philbrick, Congdon & Carpenter Co., Providence, R. I., based upon the experience of 42 members, discloses that NRA has boosted warehouse costs approximately 15 per cent.

Reporting on alloy steels, Mr. Ressler said action by the mills on small quantity extras will be deferred until publication of the new book of extras and deductions sometime in October.

Seek To Clarify Sheet Sales

As chairman of the sheet steel committee, Mr. Ressler stated that the warehouses have lost ground during the year in clarifying sales of sheets through warehouses. The chief obstacle has been that certain distributors insist upon placing direct mill orders for less than carload lots; consequently no changes have been made in the prevailing mill extras on less-carload sheet orders. However, the matter is under active consideration by the mills and some action may be taken before the end of the year.

The price reduction recently made on cold-rolled strip from warehouse is an experiment to increase the tonnage—if it fails the old price probably will be restored. The conference with the mills on tool steels revealed that the manufacturers may make any individual jobber arrangements with jobbers they desire so long as details are filed with the American Iron and Steel institute. They found the tool steel people unreasonable and difficult to deal with.

A. Y. Sawyer, Joseph T. Ryerson & Sons Inc., Chicago, reported on cold-finished material. He said it is desirable that the mills include quality extras on bessemer screw stock and 10-20 in base price to simplify the warehouse pricing problem, which is complicated now.

J. J. Hill, of Hill, Chase & Co., Philadelphia, replaces Mr. Rogers on the executive committee for the 2-year term. H. L. Edgecomb, Edgecomb Steel Co., Philadelphia; A. C. Castle, and Richmond Lewis, Charles C. Lewis Co., Springfield, Mass., were named to serve on the executive committee for one year.

Eighty new members have been received in the past year and many local chapters organized, including one on the Pacific coast, Mr. Sackett reported.

Govt. Invites Cut Prices

President Roosevelt late Friday issued this executive order relative to all purchases by government and public authorities: Any bidder complies with the code of his industry if he quotes a price not more than 15 per cent below the price filed with his code authority; this government price to be secret until bids are opened, after which he must file this price with the code authority in order that consumers can benefit from the lower price.

Industrial Men in the Day's News

Charles E. Adams, Administrator in Charge of Division 1, National Recovery Administration

Well known in the steel industry, he recently was appointed administration officer for the steel code.

President of a concern manufacturing welding equipment, he also is a director in other companies.

Besides these associations, he is chairman of three companies aligned with the chemical field.

Harris & Ewing

CHARLES E. ADAMS, who as announced in STEEL for June 18 succeeds Kenneth M. Simpson as division administrator of NRA, in charge of division 1, is well known in the steel industry. He is president of the Air Reduction Co., New York.

Born in Toledo, O., in 1881, he was educated at St. Paul's school and Yale university. He graduated from Yale in 1904 as a bachelor of arts. His first business experience was in the stock brokerage field. He became connected with F. S. Butterworth & Co., New Haven, Conn., in 1907, and in 1910 went with Callaway Fish & Co., New York, where he remained until 1917 when he became a member of the new firm of Foster & Adams.

In 1918 he was named treasurer of the Air Reduction Co. and in 1920 was elected vice president. In 1921 he was chosen president and has continued in that capacity ever since the latter date.

He is chairman of the United States Industrial Chemical Co., the Pure Carbonic Co. of America, and the National Carbide Corp. He is a director of the Commercial Acetylene & Supply Co., the Cuban Air Products Corp., the Sterno Corp. and the Vanadium Corp of America. A member of numerous clubs, he resides at 4 East Seventy-second street, New York.

As administrator of division 1 of NRA, Mr. Adams has charge of the administration of the steel code. He previously had been deputy administrator in charge of the banking and other financial codes.

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K. D. Crawford has been appointed Pittsburgh manager of the Taylor-Wharton Iron & Steel Co., High Bridge, N. J., succeeding the late J. R. Smith. Mr. Crawford formerly was associated with the American Frog & Switch Co.

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Alexander S. Henry, president of the Railway Steel-Spring Co., New York, has been appointed vice president of the American Locomotive Co., Railway Steel-Spring division. Railway Steel-Spring Co. has been a wholly owned subsidiary of American Locomotive since 1926 and now has been consolidated with the parent company.

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W. R. Judson has been appointed manager of the Salt Lake City, Utah, district office of the Allis-Chalmers Mfg. Co., Milwaukee. For the past three years he has been managing director of Allis-Chalmers (France), representing the company in Europe. Prior to that time, for 13 years, he was manager of the company's office at Santiago, Chile.

H. E. Weiss, whom Mr. Judson succeeds, has been transferred to the company's office at Kansas City, Mo.

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Edward A. Johnston, director of engineering, Inernational Harvester Co., Chicago, has been elected vice president in charge of engineering. He joined the company in 1894 as a machinist and patternmaker in the experimental department of the McCormick Harvester Machine Co.

Albert A. Jones, for the past five years assistant to the vice president in charge of manufacturing, has been elected vice president in charge of manufacturing. He has been identified with the company since 1904 when he started as auditor of the McCormick works.

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H. G. Poole, formerly consulting engineer in Cleveland, is now on the staff of the International Molybdenum Co., with offices in Moscow, Idaho.

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Paul A. Ivy, vice president of the National Cast Iron Pipe Co., Birmingham, Ala., has been elected a member of the board of directors of the Birmingham chamber of commerce.

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Paul Fielden, credit manager of the Norton Co., Worcester, Mass., was elected a director of the National Association of Credit Men at this organization's recent annual meeting in Los Angeles. He has been with Norton for about 15 years.

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Cassius M. Davis, an assistant engineer in the transportation engineering department of the General Electric Co., Erie, Pa., has been appointed engineer of the department, succeeding H. L. Andrews who recently was appointed a vice president of the company.

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H. C. Green, purchasing agent for the Gulf States Steel Co., Birmingham, Ala., recently was elected president of the Purchasing Agents association of Birmingham, to serve for the ensuing year. He succeeds LeRoy Holt, purchasing agent for the Tennessee Coal, Iron & Railroad Co.

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Robert T. Kent recently resigned as vice president and director of engineering, Divine Bros. Co., Utica, N. Y., to establish his own business as a specialist in polishing, buffing and other abrasive problems, with headquarters at 32 West Fortieth street, New York. He has been with the Divine company since 1928, and at one time was engineering editor of *Iron Trade Review*, predecessor to STEEL. He is the author of *Kent's Mechanical Engineers' Handbook*.

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Francis B. Foley, superintendent of research, Midvale Co., Philadelphia, has been elected chairman for 1934-35 of the Philadelphia chapter of the American Society for Metals. Other officers include: Vice chairman, G. W. Keller, Brown Instrument Co.; secretary-treasurer, A. O.

Schaefer, Midvale Co.; and directors, T. Holland Nelson, consulting metallurgist; W. J. Diederichs, the Autocar Co.; T. J. Moore, Edgar T. Ward's Sons Co.; N. L. Mochel, Westinghouse Electric & Mfg. Co.; W. E. Titus, Bethlehem Steel Co., and Haakon Styri, S. K. F. Industries Inc.

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N. A. Mears has been appointed purchasing agent of the RCA Victor Corp., Camden, N. J., succeeding N. R. Donohoe.

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William C. Dickey, New York sales agent for the Worth Steel Co. and New Haven Copper Co., sailed June 30 for Havre, France. He will return July 19.

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Quincy Bent, vice president, Bethlehem Steel Co., has been nominated by the American Society for Testing Materials as a member of the board of directors of the American Standards association.

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Dr. Francis Lamb, physicist at Michigan State college, Lansing, Mich., has been named spectroanalyst for the Michigan Smelting & Refining plant of the Bohn Aluminum & Brass Corp., Detroit, to conduct research on bearing materials.

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H. A. Anderson, Western Electric Co., has been elected chairman of the Chicago chapter of the American Society for Metals for 1934-35. Other officers include: Vice chairman, H. B. Knowlton, International Harvester Co.; and secretary-treasurer, K. H. Hobbie, Driver-Harris Co. Executive committee includes: R. F. Anderson, Anderson-Shumaker Co.; R. A. Bull, consultant on steel castings; J. F. Calef, Automatic Electric Co.; Otto F. Carl, Cyclops Steel Co.; L. A. Daines, Heppenstall Co.; Elmer Gammeter, Edison G. E. Appliance Co.; M. A. Grossmann, Illinois Steel Co.; J. E. Robinson, International Harvester Co.; C. L. Saunders, Brown Instrument Co.; A. J. Scheid Jr., Columbia Tool Steel Co.; and Jestyn Williams, Mills Novelty Co.

The chapter held its annual outing June 9, featuring golf, dinner and entertainment. Attendance 172.

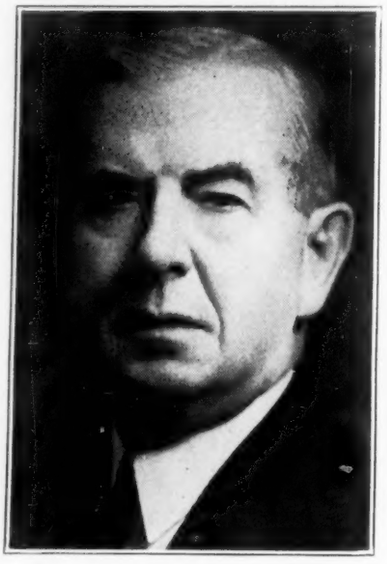
New Capacity Ban, Modernization Aid

BASICALLY, conditions in the iron and steel industry have improved. Common labor could have upset the industry a few weeks ago but its threat now is over the dam and industry again is leaning on its oars.

Such was the comment of L. F. Reinartz, chairman of the open-hearth committee of the American Institute of Mining and Metallurgical Engineers, in opening the seventeenth conference of the committee at Hotel Schenley, Pittsburgh, June 28. More than 175 members and guests attended the opening sessions, breaking all attendance records since the organization of the committee.

No technical session was held Thursday afternoon. Instead, a large delegation was conducted through two open-hearth departments of the Homestead works of the Carnegie Steel Co., Munhall, Pa. Discussion of open-hearth problems will be resumed Friday and a resume of the two technical sessions will appear in next week's issue of STEEL.

A plea for open-hearth operators to adhere to employe representation plans was made by Mr. Reinartz. He cited statistics covering various resources of this country to emphasize the fact that more prosperous times are ahead of the steel industry but he warned that steel producers must do their part in hastening the restoration of better conditions. Men must be taught how to increase their efficiency and their output per man, he said.



J. C. Griffin

President and general manager of the Griffin Mfg. Co., Erie, Pa., well-known producer of cold-rolled strip steel, who as noted in STEEL for June 25, died in that city, June 20

Under steel code ruling no new open-hearth furnaces can be built in this country, Mr. Reinartz pointed out, and he considered this a blessing in disguise. This ruling compels management and operators of open hearths to improve their existing furnaces by insulating the roofs, by widening, deepening and lengthening the hearth on the smaller tonnage furnaces and modernizing the valves by the installation of automatic control equipment on them.

After stressing the importance of training open-hearth crews from the standpoint of dollars and cents, Mr. Reinartz concluded with the announcement that Clyde Williams, director of Battelle institute, Columbus, O., would present a resume of European open-hearth practice at the next meeting of the open-hearth committee in response to various requests for this information.

Died:

LLEWELLYN W. JONES, 71, founder and president of the Manganese Steel Forge Co., Philadelphia, president of the Audubon Wire Cloth Co., Audubon City, N. J., and a former president of the Philadelphia Drop Forge Co., at his home in Rosemont, near Philadelphia, June 24. He served an apprenticeship course in the Altoona, Pa., shops of the Pennsylvania railroad and later, following his association with Philadelphia Drop Forge, joined E. T. Schoen in the founding in Pittsburgh of the Pressed Steel Car Co., where he served as genereal manager, returning to Philadelphia in 1911. He was a charter member of the Engineers' Club of Philadelphia.

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C. D. Shedd, president of the Birmingham-Trussville Iron Works, Birmingham, Ala., at his home in Chicago, June 20.

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Frederich E. Eyrich, 42, for 15 years associated with Treadwell Construction Co., Midland, Pa., in Beaver, Pa., June 24.

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Frank O. Green, 73, former president of Green Foundry & Furnace Works, Des Moines, Iowa, in that city, June 23. He was active head of the company, for 26 years, retiring from active management in 1930.

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Joseph F. Skelding, 74, for 17 years prior to his retirement 7 years ago associated with the blast furnace department of the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., in that city, June 21. He was born in England and at one time was active in the iron industry there.

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Harry L. McCauley, 44, Milwaukee district sales manager for the Inland Steel Co., Chicago, June 26, from drowning. Formerly associated with the Gary plant of the American Sheet & Tin Plate Co., he joined Inland Steel Co. in 1920 and was transferred to Milwaukee as assistant sales manager there in 1924. He was made manager in March, 1928.

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Max Ruess, 58, for 27 years chief mechanical engineer of the Filer &

Stolwell Co., Milwaukee, in that city, June 13. A native of Germany, he came to the United States in 1907.

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Michael A. Herald, 51, president of the United Car & Equipment Co., Pittsburgh, and for a number of years affiliated with the Pittsburgh Steel Co., Monessen, Pa., in Wilkinsburg, Pa., recently.

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David H. Miller, 73, vice president, Gilbert & Bennett Mfg. Co, manufacturer of wire products, Georgetown, Conn., at his home in Norwalk, Conn., June 21. He joined the company as salesman in 1897.

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Edward Fink, 65, Milwaukee consulting engineer and inventor of many processes in metallurgical chemistry, at his home in Milwaukee, June 12. He held degrees from universities in Germany and Switzerland.

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Mortimer B. Skinner, 69, founder and former chairman of the board of the M. B. Skinner, Co., South Bend, Ind., manufacturer of tools and mill supplies, at his home near South Bend recently. He had retired last December.

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Talmadge Blass, 73, former consulting engineer for the Bethlehem Steel Co. and former superintendent of coke ovens of the Lackawanna Steel Co., in Lackawanna, N. Y., June 21. He retired in 1922 after long service in the industry.

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John D. Craft, 67, one of the founders of the Hercules Corp., Evansville, Ind., and a former vice president and general manager of the company, at his home in Eevansville, recently, following a four-year illness. He was closely associated with the Graham brothers, having designed the first Graham truck.

ORIGIN OF MAY IMPORTS

Gross Tons

	Pig iron	Manganese ore	Ferromanganese
Netherlands	5,247	.....	.....
Norway	391	.....	.....
Sweden	25	.....	.....
United Kingdom	50	.....	.....
Canada	836	50	1,926
Kwantung	177	.....	.....
British India	1,902	1,988	.....
Soviet Russia in Europe	.....	10,431	.....
Brazil	.....	958	.....
Gold Coast	.....	3,905	.....
Total	8,628	17,332	1,926

	Sheets, skelp and sawplates	Structural steel	Steel bars	Hoops and bands
Belgium	149	1,716	1,005	875
United Kingdam	4	.....	68	10
Sweden	21	.....	270	.....
France	.....	220	469	379
Germany	.....	10	68	79
Canada	.....	.....	1	.....
Norway	.....	.....	4	.....
Austria	.....	.....	33	.....
Czechoslovakia	.....	.....	9	.....
Spain	.....	.....	.....	7
Total	174	1,946	1,927	1,350

May Foreign Trade Shows Marked Gain

FAIRLY consistent growth in volume of foreign trade in May brought a gain of 40,214 tons in exports and of 2603 tons in imports, according to figures by the iron and steel division, bureau foreign and domestic commerce, Washington.

Exports in May were 241,753 gross tons, compared with 201,539 tons in April, nearly 20 per cent larger. The largest increase was made by scrap, 6038 tons, from 126,687 tons in April to 132,725 tons in May. Other items showing gains included steel skelp, from 1042 tons in April to 21,882 tons in May, seamless oil line pipe from 2479 to 7315 tons, billets and semifinished steel 250 to 2452 tons, shapes 3365 to 4932 tons.

Imports in May were 29,465 tons against 26,862 tons in April, a rise of 9.7 per cent. Ferromanganese imports increased from 2671 tons in April to 3422 tons in May, scrap from 5214 tons to 6975 tons and barbed wire from 855 tons to 1333 tons.

Cumulative figures for five months show that exports have grown from 415,169 gross tons in 1933 to 1,033,768 tons in 1934; imports have increased from 117,892 tons in 1933 to 142,780 tons in 1934.

FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL

Gross Tons

	1934 Imports	1934 Exports	1933 Imports	1933 Exports
Jan.	22,653	178,023	21,892	56,720
Feb.	25,407	151,184	19,748	63,936
Mar.	38,393	261,269	22,114	80,567
April	26,862	201,539	28,061	100.395
May	29,465	241,753	26,295	123,069
5 mo.	142,780	1,033,768	117,892	415,169
June	.....	.....	34,368	102.581
July	.....	.....	52,805	83,311
Aug	.....	.....	46,839	119 374
Sept.	.....	.....	55,706	108,799
Oct.	.....	.....	46,673	164,755
Nov.	.....	.....	28,979	157,600
Dec.	.....	.....	31,310	184,585
Total	.....	.....	414,790	1,350,692

UNITED STATES IMPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

Commodity	May 1934	April 1934	May 1933
Pig iron	8,628	8,253	9,548
Sponge iron	111	127	52
Ferromanganese, spiegeleisen	3,422	2,671	3,890
Ferrochrome	14	.....	.....
Ferrosilicon	87	55	.....
Other ferroalloys	33	.....	.....
Scrap	6,975	5,214	4,370
Steel ingots, blooms, etc	60	35	17
Concrete bars	90	26	371
Hollow bar, drill steel	64	70	57
Merchant steel bars	1,923	2,074	1,099
Iron slabs	.....	.....	.....
Iron bars	48	158	77
Wire rods	1,236	1,208	961
Boiler and other plate	22	.....	27
Sheets, skelp, saw plate	174	672	417
Tin plate	25	2	21
Structural shapes	1,946	1,821	2,113
Sheet piling	443	.....	.....
Rails and fastenings	201	321	312
Cast iron pipe, fittings	4	.....	87
Welded pipe	54	107	243
Other pipe	141	375	80
Barbed wire	1,333	855	445
Round iron, steel wire	260	224	137
Telegraph, telephone wire	.....	.....	.....
Flat wire, strip steel	92	131	87
Wire rope, strand	55	154	117
Other wire	3	61	108
Hoops and bands	1,350	1,423	1,131
Nails, tacks, staples	456	615	485
Bolts, nuts, rivets	35	48	34
Horse and mule shoes	52	47	25
Castings and forgings	128	115	63
Total	29,465	26,862	26,374

UNITED STATES EXPORTS OF IRON AND STEEL PRODUCTS

Gross Tons

Commodity	May 1934	April 1934	May 1933
Pig iron	478	310	88
Ferromanganese, spiegeleisen	.....	6	1
Iron and steel scrap	132,725	126,687	89,328
Ingots, blooms, billets, slabs and sheet bars	2,452	260	172
Bars, iron	262	51	32
Bars, steel	4,427	4,828	1,516
Bars, alloy steel	344	343	197
Wire rods	2,083	1,795	532
Boiler plate	50	111	36
Other plate, not fabricated	2,299	3,338	574
Skelp, iron or steel	31,882	1,042	1,102
Iron sheets, galvanized	187	105	134
Steel sheets galvanized	4,629	4,454	2,958
Steel sheets, black	8,147	7,134	2,290
Iron sheets, black	455	449	104
Strip steel, cold-rolled	1,447	1,682	720
Hoop, band and scroll iron or steel	1,285	1,427	986
Tin, terne plate	10,541	11,496	4,189
Water, oil, gas and other tanks, except lined	147	392	7
Shapes, not fabricated	4,932	3,365	572
Shapes, fabricated	1,155	1,236	758
Plates, fabricated	368	285	271
Metal lath	105	54	48
Frames, sashes and sheet piling	76	112	810
Rails, 50 pounds	4,904	7,916	1,352
Rails, under 50 pounds	407	532	10
Rail fastenings	691	623	90
Switches, frogs, crossings	57	63	20
Railroad spikes	102	115	48
Railroad bolts, nuts	39	69	13
Boiler tubes, seamless	639	567	226
Boiler tubes, welded	37	72	25
Casing and oil-line pipe, seamless	7,315	2,479	3,724
Casing and oil-line pipe, welded	1,166	2,228	130
Seamless black pipe, other than casing, etc.	196	137	79
Malleable iron screwed pipe fittings	247	214	193
Cast iron screwed pipe fittings	93	121	51
Cast iron pressure pipe and fittings for	246	142	608
Cast iron soil pipe and fittings for	160	166	219
Welded black steel pipe	1,539	2,133	868
Welded black wrought iron pipe	349	53	37
Welded galvanized steel pipe	1,903	2,272	1,747
Welded galv. wrought iron pipe	71	58	12
Riveted iron or steel pipe and fittings	78	14	5
Plain iron, steel wire	1,470	952	337
Galvanized wire	1,584	1,678	552
Barbed wire	3,415	3,047	2,688
Woven wire fencing	129	137	67
Woven wire screen cloth	93	67	37
Wire rope	236	339	109
Other wire and manufactures	405	438	256
Wire nails	1,402	1,461	668
Horseshoe nails	60	83	36
Tacks	51	45	27
Other nails, staples	310	379	257
Bolts, machine screws	436	451	264
Iron castings	597	472	97
Steel castings	168	426	48
Car wheels and axles	239	262	222
Horseshoes	2	21	2
Iron and steel forgings, n. e. s.	441	345	403
Total	241,753	201,539	122,952

EDITORIAL

Unwary Public Drinks From Poisoned Wells

ANOTHER good reason why industry should not lose any time in assuming the offensive in presenting its case to the American public, as advocated in this column last week, is furnished by the persistent attitude displayed by certain newspapers in maligning industry.

The publishers and editors guilty of this practice probably have no particular grudge or grievance against industrial concerns. More than likely, their flagrant distortion of the truth is due more to an unconscious, blind aping of the new deal policy of slandering industry than to deep-seated prejudice against American manufacturers.

To illustrate how the public mind is being poisoned by untruthful press articles, let us examine an installment in a series of articles entitled "Steel and Its Men," by Mac Parker, appearing in the *Philadelphia Record*. The subtitle in the June 26 issue is "Terrific Hazards Peril Workers Who Labor in Searing Heat for Mere Pittance."

Tries To Picture Steel Mills As Torture Chambers Where Life Is Cheap

The first paragraph reads as follows: "Men are numbers in the steel mills; life is cheap; the hazards are terrific. And for what?"

In the second paragraph we find this sentence: "A thousand dangers lurk in every corner, deafness, blindness, lost fingers, mangled hands, broken bones, crushed bodies, burned bodies."

Next comes this paragraph: "Stroll through a mill town some day. Count the cripples, the discards. The industry cannot absorb the men it has wrecked. It can find jobs as gate tenders, watchmen, messengers, for only a few."

Further down in the article, one reads: "You may not be taken through the wire mill. It is too hazardous for visitors. Yet men must stand there ever alert to race for their lives if a white hot strand misses the train of rolls and runs amuck."

These excerpts will suffice to indicate that the author intends that the readers of the *Philadelphia Record* shall be given the impression that the hazards of steel mill employment are "terrific."

What are the facts?

In 1932 (the last year for which statistics are available) the frequency rate for industrial accidents in rod mills in the United States was 16.99 per 1,000,000 hours exposure.* In the same year the frequency of accidents in the paper and printing industries of Pennsylvania (which would include newspapers such as the *Philadelphia Record*) was 13.81 per 1,000,000 hours.** In other words, the "terrific hazards" in wire mills, which, according to the *Record's* reporter, are too horrible for visitors, actually were only slightly greater than in the industry from which the reporter draws his salary. The frequency rate for rod mills in 1931 was only 9.01, while that for paper and printing in Pennsylvania was 15.91.

Industry's Record in Reducing Accidents Is a Remarkable Achievement

The truth is that the steel industry has made a glorious record in reducing accidents. It has cut the frequency rate for all employes from 82.06 in 1907 to 18.06 in 1932. Where will one find a better record!

Actually, the hazards in the steel industry are much less than generally realized. We submit a few comparisons for 1932 (Data from the U. S. bureau of labor statistics):

	Frequency rates per 1,000,000 hours
Entire steel industry	18.06
Blast furnaces	15.39
Bessemer converters	11.62
Open-hearth furnaces	11.09
Bar mills	14.30
Sheet mills	13.92
Heavy rolling mills	10.74
Foundries	36.68
Fabricating shops	29.98
Electrical departments	4.17
Mechanical departments	8.66
All civilian U. S. government employes	21.31
U. S. department of agriculture	61.42
U. S. department of commerce	14.01
Government printing office	3.67
U. S. department of interior	36.74
U. S. post office department	13.40

The government's own figures show that on the average a steel industry employe in 1932 was subject to fewer accidents than a civilian government employe. A converter, open-hearth or heavy mill employe was safer than a U. S. post office department employe.

* * *

Industry must utilize facts like these to offset the distorted statements regarding industry which are being disseminated under the emotional spell of the new deal.

Again we urge every industrial executive to help sow the seed of truth about industry in the minds of the American public.

*Monthly Labor Review, U. S. bureau of labor statistics, page 571, September, 1933. **Page 558, March, 1934.

THE BUSINESS TREND

New Variables Make Trend Lines Awry

COMPARISON of current business records with normal seasonal trends is impractical under present conditions. So many new variables have been introduced by artificial agencies that the once significant relationships now are meaningless.

Provisions of NRA codes artificially influenced the curve of soft coal production in March and April, is affecting the trend of textile production, and is causing an unnatural, abrupt break in the chart of steelworks operations. In the automobile industry there are signs that the old familiar peaks and valleys of production in a normal year will be changed permanently. Perhaps in another year many of the "normal" lines, on which adjustments for seasonal variations are based, will have to be revised drastically.

The federal reserve board's index of industrial production for May stands at 87. In July, 1933 it registered 100. Offhand, industrial activity in May seemed to rate higher in relation to that of last July than 87 per cent; therefore we compared the detailed figures:

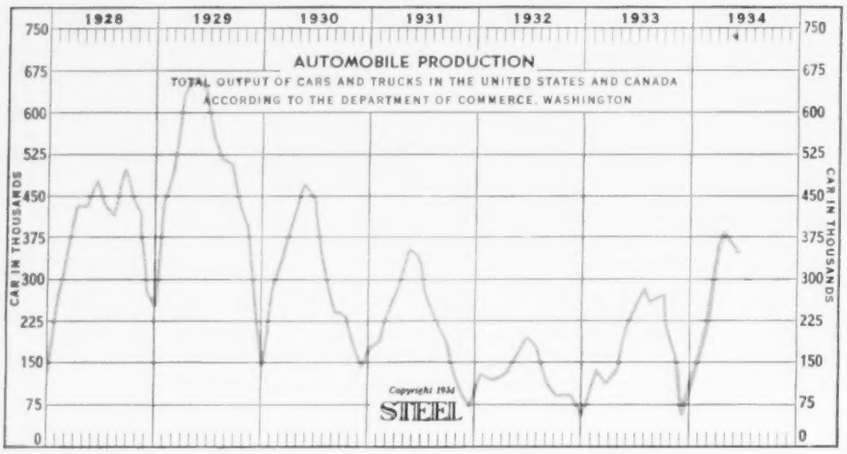
	May, 1934	July, 1933
Industrial production index	87	100
Manufactures	86	101
Automobiles	78	70
Cement	57	56
Food products	98	100
Iron and steel	85	100
Lumber	33	46
Petroleum refining	152*	155
Rubber tires and tubes	118*	143
Textiles	89	130
Tobacco	128	117
Minerals	89	90
Anthracite coal	76	67
Bituminus coal	72	76
Iron ore	40	40
Petroleum, crude	128	132
Zinc	65	71

*April, 1934.

This shows that the index for May fell short of that of last July largely because of deficiencies in iron and steel (May pig iron output exceeded that of July), lumber, and textiles. Nevertheless electric power output, department store sales and freight car loadings—good general indicators of business—were higher in May than in July. Possibly they helped to give the impression that business was better balanced in May than at the peak last year.

1934 Per Cent	
May	87
April	86
March	85
Feb.	81
Jan.	78

1933 Per Cent	
May	78
April	66
March	59
Feb.	63
Jan.	65



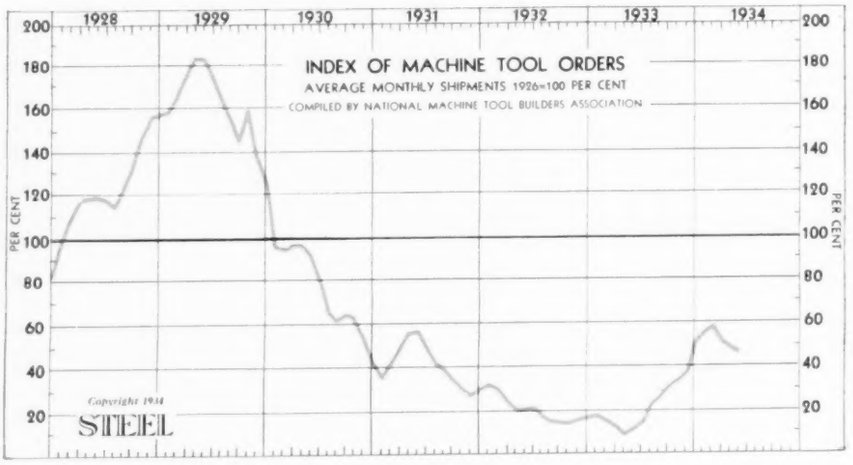
May, 1934	351,802
April, 1934	373,108
May, 1933	224,228

Automobile Output Tapers Off During May

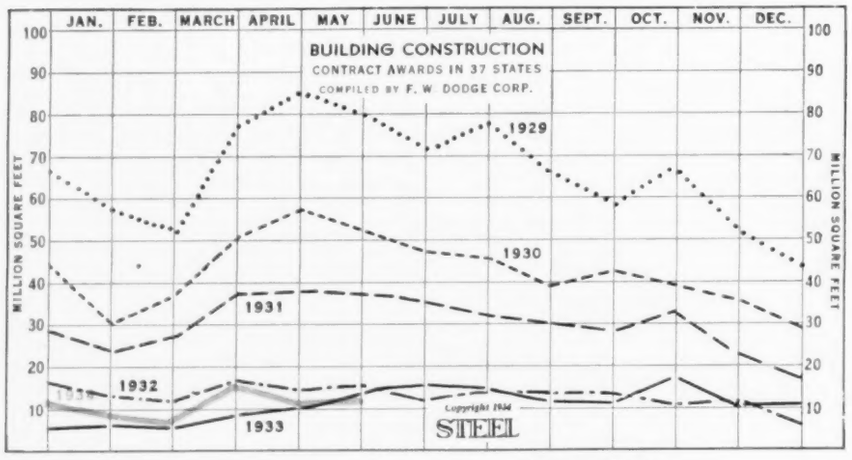
Automobile production in the United States and Canada during May declined 21,306 units, the first recession since November 1933 when the output figure dropped to 63,322 units. The latest report from the department of commerce places the output of passenger cars and commercial motor vehicles at 351,802 units of which 20,161 were produced in Canada. Output in April totaled 373,108 units and in May, 1933 production amounted to 224,228 units.

May Machine Tool Orders Ease Off Slightly

The index of machine tool orders has been changed to include orders for all members of the machine tool and forging machinery industry code, with a revised base, in which average monthly shipments for 1926 equals 100. In comparing with the old chart (STEEL April 9, p. 22) the new base has the effect of lowering the index. According to the National Machine Tool Builders' association, the three-month average for May was 46.8 a drop of nearly 2 points from the 48.5 per cent in April and compares with only 10.6 per cent in May, 1933.



May, 1934	46.8
April, 1934	48.5
May, 1933	10.6

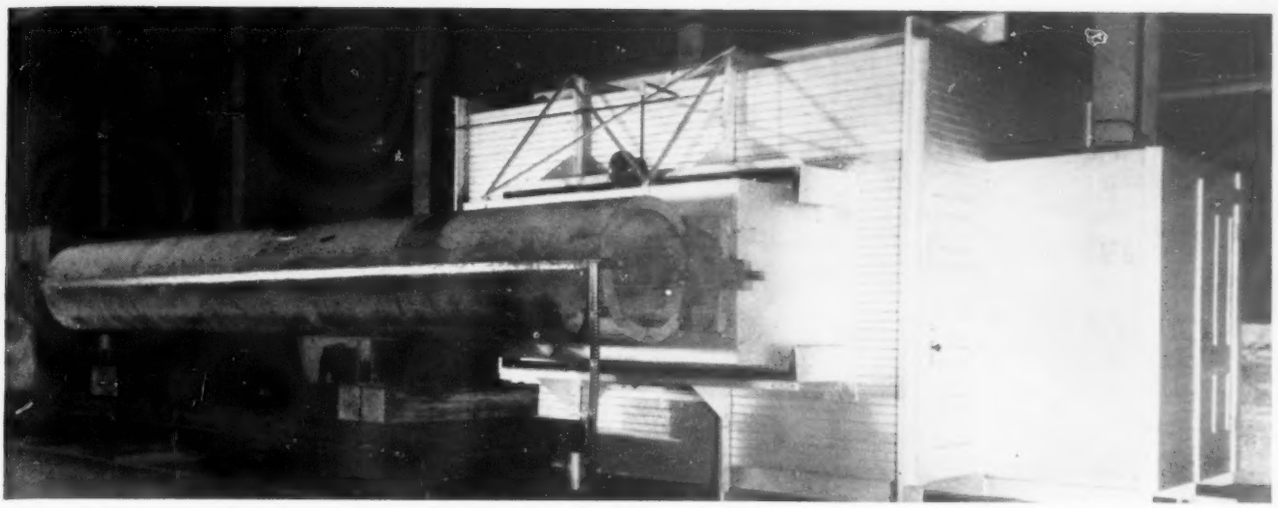


Square Feet

May, 1934	14,664,400
April, 1934	14,207,100
May, 1933	15,277,000

Building Awards Show Slight Upturn in May

Building awards as measured in new floor space in 37 eastern states advanced slightly in May. According to the report of F. W. Dodge Corp., total construction for the fifth month involved 14,664,400 square feet as compared with 14,207,100 in April. In May, 1933, awards totaled 15,277,000 square feet. In the five months of 1934 awards for new floor space have aggregated 61,603,000 square feet compared with 51,872,500 in the same period last year.



X-ray machine for examining fusion welded pressure vessel seams. Thickness of 4½ inches can be explored on production basis

How Fabricators Are Affected by Revisions in Boiler Codes

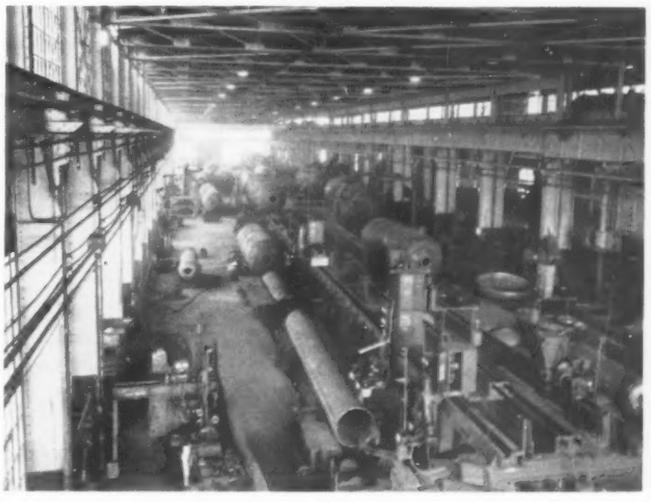
PROPOSED marine boiler rules of the bureau of navigation and steamboat inspection, when approved, will result in radical changes in the present rules governing the inspection and permissible construction of boilers, coming under the supervision of this bureau. This has led to some conjecture as to whether or not the adoption of the suggested changes will affect seriously the procedure followed in the manufacture of marine boilers or increase, to any considerable extent, their cost.

Parenthetically, it may be said that the proposed rules represent a vast amount of work, and when adopted, as now seems certain, they will stand as a monument to the untiring efforts of the bureau since that body initiated the movement in 1928.

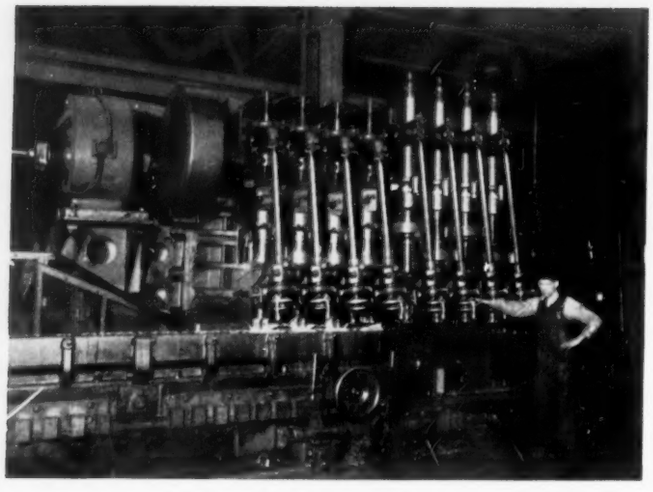
In view of the foregoing it may be of interest to review, in a general way, the procedure followed in a modern plant, active in the production of boilers for both marine and land service. Although the establishment selected, the Barberton, O., works, of the Babcock & Wilcox Co., may be larger than the average boiler plant, some broad conclusions may be drawn with respect to this conjecture.

Important facts to consider in this connection are the general aims of the new rules, which are, briefly, to bring them into closer agreement with existing boiler codes and to permit the use of welded drums, a construction now generally accepted for land service. It is thus evident that, although the proposed marine boiler rules were drawn up with proper regard for operating conditions and special requirements peculiar to marine service, recognition is given to certain practices or rules that have proved of value in the construction and inspection of land boilers. It is appropriate therefort, to examine the shop methods followed in constructing not only marine boilers, but also, in certain respects, land boilers.

Under the proposed rules, boiler plate would



SECTION of shop devoted to welding of boilers and pressure vessels. Equipment is flexible, permitting a wide range of welded products to be handled



TUBE holes of headers for watertube boilers are drilled on a mass production basis — with special machines such as the one shown here

have to meet specifications covering chemical composition, tensile strength, and bend tests. It has long been the practice of the Babcock & Wilcox Co. to order plates to specifications that are more complete and, not only to check the properties mentioned, but to investigate other characteristics, including that of microstructure. In addition, for every plate used, a complete history is maintained, in which is recorded the heat from which the plate was rolled at the steel mill, all the tests made at the mill, the tests and examinations made in the laboratories of the company, and the exact location of the plate in the boiler. A similarly complete record is kept of all materials used by a subsidiary company, the Babcock & Wilcox Tube Co. in the manufacture of seamless tubes.

Provides Complete Records

This practice may appear to be somewhat extreme, but, in the opinion of the company, it is simply a method of providing records, which are as complete as possible, for future reference and study of a transaction in which safety transcends all other considerations.

An important element of what is undoubtedly the most typical of marine watertube boilers is the header. Under the proposed rules, the manufacture of this element will not undergo any change. In viewing this process, one cannot fail to get the very decided impression that special equipment and production technique have been so admirably coordinated as to result in precision-like production of finished forgings.

Although improvements in this process may be difficult to conceive, in one respect an improvement has been effected in recent years. Formerly the open ends of the headers were closed with flat plates, forged in place. Now the ends are heated and rolled or spun inward, on a machine designed especially for the purpose, thus providing ends that are integral with the main body of the header. At the center of the ends, where the spun metal might be porous, small plugs are inserted: these are shouldered inside and welded at their outer ends. Incidentally, this is, on a small scale, the same method the company has used to close in, by spinning, the ends of larger headers and some boiler drums for land service.

OFFICIAL adoption of the proposed new rules covering marine boiler construction, expected shortly, and recent and pending changes in boiler codes generally, tend to direct attention to the methods employed in fabricating and testing pressure vessels. The accompanying article is abstracted from a discussion prepared by the staff of the Babcock & Wilcox Co., Barberton, O., for publication in the June issue of MARINE REVIEW. An interesting picture is presented of the modern fabricating shop where a wide variety of boilers and pressure vessels are produced

The next step in header manufacture is the testing of the blanks, which consists of subjecting these unmachined parts to a hydrostatic test of twice the working pressure.

The blanks are then machined in what may be described as two operations. The one operation consists of trepanning the tube holes in a multiple-spindle drilling machine that, as is the case with much of the equipment used in the plant, was especially designed and built for performing one operation. A typical machine for this purpose is capable of trepanning eight groups of four 1-inch or 2-inch tube holes simultaneously.

In the other operation, elliptical handholes are machined in the side of the header opposite the tube holes. This operation, because of the shape of the holes, is, of course, more complex and consequently is performed on a machine more highly specialized than that used for the tube holes. It will profile eight elliptical handholes in one operation. The header is chucked on a table or carriage under the spindles and is moved in an elliptical path by a cam mechanism while the eight profiling spindles cut the edges of the handholes to shape.

Careful Installation of Tubes

The tubes are expanded into the headers in the shop, to form tube sections. In this operation the headers are mounted on racks, or what is termed a "header bench," and securely held in place by a chucking arrangement that automatically sets the headers with respect to the tubes and each header with respect to the other, in a uniform and unvarying position, so that when the sections are later erected in place in the boiler, they will be interchangeable and accurately aligned with the other parts of the boiler to which they must be connected.

Power-driven expanders are used, the operator at one end working two or more tubes in advance of the operator at the opposite end, to prevent any tendency toward the setting up of strains in the tubes—a refinement in operating methods that distinguishes modern boilermaking from

NINE of 24 boiler drums with fusion welded seams for scout cruisers of the navy department. Ordered in 1930, these are first boilers of this construction for naval vessels

the methods that have earned for the old fashioned boilermaker his reputation for crude workmanship.

After the tube sections are completed, each is hydrostatically tested to one and one half times the working pressure, thus concluding one series of tests of materials and workmanship made to assure the accuracy and soundness of the sections. First, there are the tests of materials at the steel mill. These are followed by laboratory tests at the boiler works or tube mill, the spinning-in of header blanks—really constituting another test—the hydrostatic test of finished headers, a whole series of tests of tubes at the mill, and finally, the hydrostatic test of completed sections. In fact, there are separate series of tests and inspections, such as these, throughout the entire manufacturing process.

Would Permit Welded Seams

The manufacture of drums would, under the proposed rules, undergo a complete change, because fabrication by welding would be permitted and, judging from the wide acceptance of this construction for land service, would soon be the prevailing method. However, this change should in no way work a hardship on a modern boiler shop, since the up-to-date manufacturer is now employing welding for this purpose. For instance in the plant under consideration, more than 1400 boiler drums with fusion-welded seams have been produced to date. Length of seams in these drums and other pressure vessels is over 90,000 feet. Prior to that time, this manufacturer had done considerable research work in fusion welding, and, during the course of this investigation, had made over 10,000 laboratory tests, had carried out repeated-pressure tests of 31 drums and shells, which were subjected to hydrostatic pressures varying from 0 to 1½ times the working pressure, some of them through 2,000,000 cycles.

This manufacturer had also tested to destruction, under hydrostatic pressure, four full size drums of different constructions, including riveted and welded, as well as one seamless drum, and had determined the endurance limit of the deposited weld-metal with rotating beam machines, whereby some specimens were given over 30,000,000 cycles of reversed bending stresses.

Before the fusion welding process was finally used for the commercial fabrication of boiler drums and unfired pressure vessels, a complete study was made of nondestructive tests, whereby the soundness of welds in finished products might be determined. This study included an investigation of the practicability and reliability of the various well known physical, chemical and microscopic tests of coupons or test pieces taken from main welded seams, electromagnetic tests, and X-ray examination. As a result, a thoroughly satisfactory test procedure, definitely proving the quality of welds, was developed.

Forming Drum Plates

Drum plates are laid out and machined to size. The edges of the plates that, when assembled, will be united by welding are planed to form a conventional U-shaped welding groove. The bending or rolling of the plates to cylindrical form is done in the same manner and by the same process as that used to shape plates for riveted drums—large and thick plates are formed cold in the process or, if they are of unusual thickness, they are hot pressed. Smaller plates are rolled.

In viewing the equipment required for this work, the visitor cannot fail to be impressed by its magnitude. On the one hand is a gigantic roll capable of bending plates 26 feet in length; nearby, a mammoth hydraulic press, capable of hot-pressing plates 4¼ inches thick, to form halves of a cylinder of only 30 inches inside diameter, towers above the visitor.

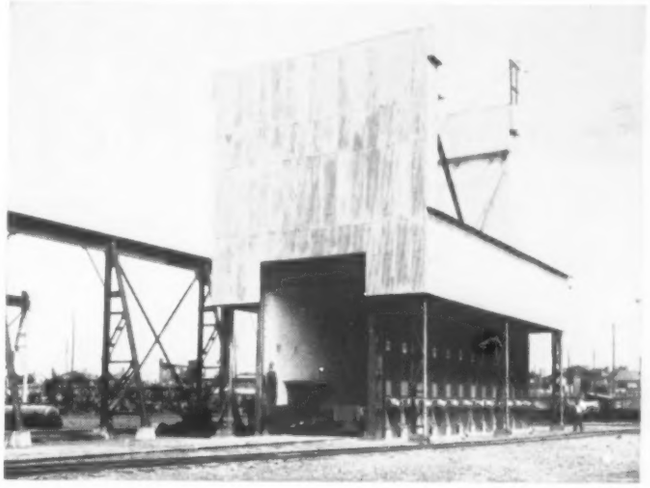
After the plates are formed, they are tack-welded together temporarily with steel strips at the bottoms of the grooves that are to receive the metal deposited during the welding process. The drum is then set up under an automatic welding machine that welds the plate edges together. Flux-coated metal electrodes are mounted in the welding heads of the machines and, as the molten metal from the electrode or rod is deposited in a longitudinal groove, the welding machine moves slowly along the drum, and, in the case of a circumferential groove, the machine remains stationary while the drum is revolved on a special cradle. The electrode, in each case, lays a thin layer of weld metal that is covered by the flux and is thereby protected from the atmosphere. Thus, layer by layer, the weld metal is deposited until the joint is completed.

The coating on the electrodes, a result of the company's extensive research work in welding, plays an important part in the process, since, as has been stated, it protects the molten weld metal from the atmosphere during deposition. If the metal were not so protected, the oxygen and nitrogen present in the surrounding air would combine with the iron in the molten metal, forming oxides and nitrides that, in turn, would render the weld metal weak, or brittle, or both.

The flux, by forming a blanket over the liquid and semi-liquid metal in the weld groove, prevents this contamination by the atmosphere, and, when the layer of weld metal or bead is laid and cooled, the solidified, brittle slag is easily removed, and the bright weld metal exposed for the laying of the next bead.

In the development of the welding process, considerable thought was given to the shape of the bead and to its convexity or concavity, since this factor would make easy or difficult the removal of the slag after a bead was laid, and would affect the tendency of the bead to trap or entrain particles of slag during subsequent deposition. It is of interest to note that the shape of bead finally adopted prevents the formation of small grooves or channels in which slag could lodge, and the cleaning operation is so complete as to obviate the possibility of slag inclusions due to improper preparation for the succeeding layer of weld metal.

The deposition of the weld metal in relatively thin layers results in the tendency of each deposit to anneal the preceding layer, and eliminates the danger of damage to the grain structure of the plate metal adjacent to the weld. That this method of metal deposition accomplishes the desired result is shown by numerous photomicrographic studies made during the development of the welding process and continued as part of the routine in the regular production of fusion welded boiler drums and unfired pressure vessels.



ONE of the world's largest stress relieving furnaces, with length of 60 feet, inside width of 14 feet 6 inches. It is used for stress relieving fusion welded pressure vessels

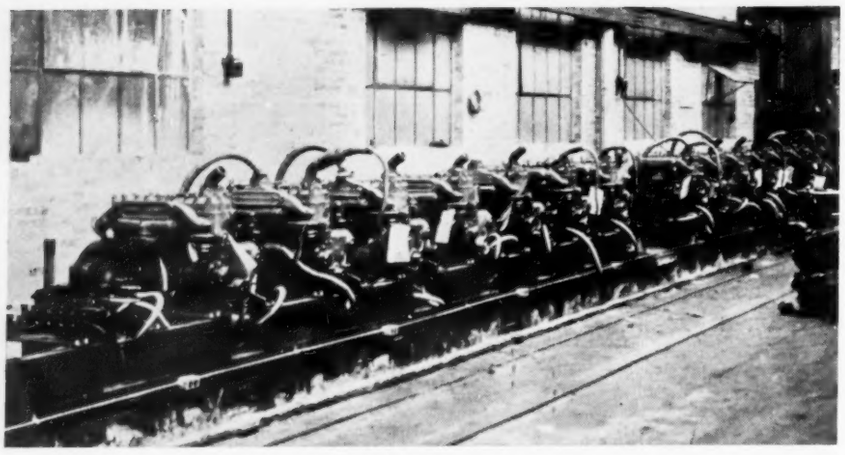


Fig. 1—Group of automobile engines with molybdenum iron cylinder blocks, mounted on test platform

Improving Performance and Economy of Cast Iron

BY C. M. LOEB JR.
Climax Molybdenum Co.

DURING the last five years the use of molybdenum in cast iron has grown from a metallurgical curiosity to a commercial application of large and still growing proportions. During these same five years the world has undergone a severe financial crisis. These two facts do not logically coincide. The question naturally arises: "How could an alloying element, previously unknown in gray iron and relatively expensive in cost per pound, make such tremendous strides throughout the depression?"

Many answers suggest themselves to this question, but a general statement will serve to introduce the subject. Molybdenum has not only proved itself an economical addition to formerly unalloyed gray iron, but it also has successfully replaced and improved iron containing other alloys, at the same time often reducing total alloy cost. The saving is either in actual cost of alloys, or by reducing the number of rejects.

Before going into the properties imparted by molybdenum it may be well briefly to summarize the physical properties imparted to gray iron by molybdenum addition. Often a foundryman must meet certain specifications for tensile strength, transverse strength and deflection; what follows will show the effect of molybdenum in improving these and other properties.

Molybdenum additions increase the tensile and transverse strengths—usually increasing the deflection at the same time. While on this subject, it may be of interest to know that molybdenum is the only alloying element for cast iron that will, when added to any particular base iron, increase both the transverse strength and the deflection. The resultant increase in toughness is evident immediately when this fact is taken into consideration.

Figs. 3 to 6, inclusive, show the effect of molybdenum on the microstructure of cast iron. The refining of graphite, and sorbitization of the matrix is immediately evident. Fig. 7 shows the fracture of two arbitration bars, the one on the left being the base iron, the other being the same iron with molybdenum added. The refined fracture in the molybdenum iron is apparent.

Molybdenum not only is effective alone, but also produces improved iron when alloyed with nickel or chromium, or both. When high physical properties are required, with not too much emphasis on machining qualities, a chromium-molybdenum iron is the least expensive combination of alloys to produce desired results. When no improvement in machinability is necessary, but higher physical properties than the unalloyed iron are required, a plain molybdenum iron is advisable. Nickel, added to a molybdenum iron, with a lowered silicon content to neutralize the graphitizing action of nickel, will produce remarkably strong irons which are commercially machinable at hardnesses as high as 293 brinell.

Molybdenum has a strong effect upon growth resistance and high temperature strength in iron. Molybdenum gray iron machines better than an unalloyed iron of the same brinell hardness. This statement has been proved in many machine shops.

Better Wearing Qualities

Molybdenum iron wears better than unalloyed iron, partly because of the uniformity throughout the casting, and partly because of inherent toughness of the iron. Naturally, for an iron of any particular wear resistance, the life is dependent upon how far a part may *wear* away before it *breaks*.

Molybdenum intensifies the action of other alloys in iron, and is often added to a chrome-nickel iron to improve its properties generally.

Molybdenum has a strong tendency to produce a uniform iron throughout large sections, and in widely varying sections. This property to close the grain in iron is one in which every foundryman is interested. When making a casting with only heavy sections, it is often possible to adjust the mix in the cupola so that the proper iron will come down, but to produce a casting with both thin and heavy sections may cause either chilling in the thin sections or porosity in the heavy parts.

Since it insures uniformity

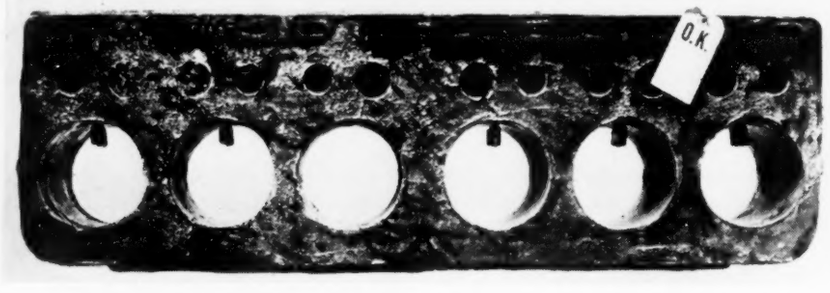


Fig. 2—Rough casting of molybdenum iron cylinder block

A paper presented June 15 before the Connecticut Foundrymen's association at Meriden, Conn. The author, C. M. Loeb Jr., is metallurgical engineer for the Climax Molybdenum Co., New York.

throughout heavy sections in cast iron, molybdenum can be used to eliminate shrinkage. It is well known that the production of high test iron by means of lowering the total carbon and silicon contents, and possibly adding nickel to replace some of the silicon, causes an iron to shrink. The shrinkage usually can be eliminated by raising the carbon and silicon contents. The only disadvantage is the resultant open grain. Molybdenum will close this grain and therefore, molybdenum can be used, although indirectly, to eliminate shrinkage.

Use of molybdenum should not be misunderstood. It is not a panacea for all ills; it will not make a bad iron good, although it will improve it to some extent. It can be used where there is no need for it; and too much molybdenum will cause machining difficulties.

Design of Part Is Factor

Good molding and melting practice always will be prerequisites in the production of high grade iron. Even shrinkage often can be eliminated in an unalloyed iron, with cooperation between the patternmaker, designer and foundryman. But there are parts made of cast iron which, because of over-all weight limits, space in a machine, or other engineering limitations, require the production of a casting intrinsically difficult to feed. In this case a high-carbon, high-silicon iron with a molybdenum addition will give the proper pouring and solidification characteristics with a resultant close-grained casting.

Foundrymen often add molybdenum in amounts of around 0.25 per cent to castings which are cracking in the mold. The property of molybdenum to toughen iron, even when it is still hot, is especially valuable to producers of malleable iron, when the hard iron casting has a strong tendency to crack on cooling.

Molybdenum is a versatile alloy. It is easily added in the spout or ladle in the form of ferromolybdenum, the alloy going into solution in the iron almost instantly. Its great advantage in this relation is that it permits a jobbing foundryman to use the same base mix all day, varying the properties of the iron for different sections and castings by the addition of proper amounts of molybdenum with nickel or chromium when necessary.

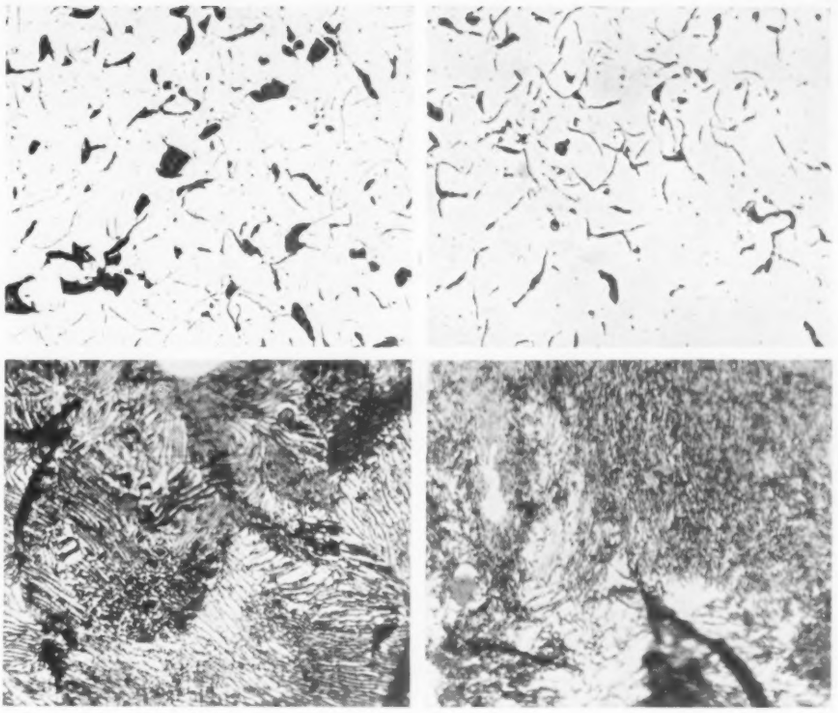


Fig. 3 (Upper left)—Plain iron unetched. X100. Fig. 4 (Upper right)—Molybdenum iron unetched. X100. Fig. 5 (Lower left)—Plain iron etched. X500. Fig. 6 (Lower right)—Molybdenum iron etched. X500. Molybdenum refines the graphite and sorbitizes the matrix

Effect of Molybdenum on Three Types of Cast Iron

	Molybdenum, per cent	Tensile strength, pounds per square inch	Transverse strength, pounds	Brinell hardness number	Machinability rating according to type
Cylinder iron	.....	29,000	3500	198	Good
	0.35	38,000	4400	208	Very good
Piston iron	.....	28,000	3300	201	Good
	0.80	41,000	4700	213	Very good
Die iron	.....	40,000	4800	235	Good
	1.00	56,000	6400	285	Good

The accompanying table shows the effect of molybdenum on three types of commercial iron. A brief summary of the commercial uses of molybdenum would include the following: Gears; flywheels; valves; hot water heaters; pulleys; frames for machine tools, and other large frames; cylinder liners; roaster rabbles; roaster arms; lead pots; slag pots; dies; cylinder blocks; cylinder heads; exhaust manifolds; clutches; brakedrums; pistons; rolls; rod mill guides; chills; stoker parts; bottle molds, and ingot molds.

Due to molybdenum's effect in

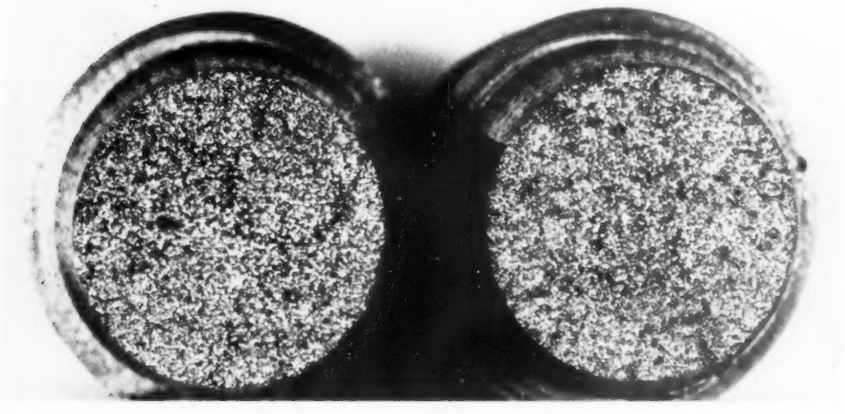


Fig. 7—Fractures of two cast-iron arbitration bars, the one on the right containing molybdenum, the other being the base iron. Addition of molybdenum has refined the fracture

toughening carbides in white iron, at the same time refining the grain and hardening the iron, this alloy iron is rapidly extending its application to parts subjected to excessive wear. White iron containing molybdenum is going into service where ordinary white iron has been too brittle even to install the part.

From 0.25 to 0.50 per cent molybdenum is being used in chilled rolls for steel mills. Its effect is valuable in that it toughens the iron, causing it to retain its smooth surface longer between dressings, and also in its deep hardening effect whereby more redressings can be applied before scrapping the roll.

Consistent hardnesses of over 600 brinell are obtainable on the chilled surface, with heretofore unapproachable toughness. Analysis can be varied to give a depth of chill of at least 10 inches, to a ¼-inch chill with machinable gray iron within ½-inch of the chilled surface. Fig. 8 shows the fracture of a chilled iron of this type. The development has been so recent that little thought has been given to the many possible applications, but a range from coffee mill burrs to steel mill rolls is easily included in its economic possibilities.

Fig. 8—Typical fracture of chilled iron containing 0.25-0.50 per cent molybdenum and suitable for steel mill rolls. Molybdenum exerts a toughening and deep hardening effect

Economy Shown by Tests

Addition of small quantities of molybdenum with chromium to white iron already has proved truly economical. In a certain type of ball mill the addition of 0.50 per cent molybdenum and 0.30 per cent chromium outlasted the same base iron without the alloys by anywhere from 120-160 days.

Molybdenum also has its place in the heat treated, hard iron castings, which include malleable iron, Jewell alloys, Z-metal and others. As mentioned before, the recovery on sound, hard iron castings is increased by a molybdenum addition, as well as strength, toughness and wear resistance. One producer of automobiles has found that as little as 0.20 per cent molybdenum doubles the life of malleable brake drums.

Molybdenum in amounts from 0.50 per cent up has a tendency to retard the annealing in the malleable process. This can be overcome by the addition of a graphitizer such as silicon, nickel or copper. One patent includes the addition of molybdenum to produce a shorter cycle malleable iron. This is done by raising the silicon content substantially, while still obtaining a hard iron casting. Although brief, the information so far available on molybdenum malleable iron is encouraging enough to instigate further experimenting by several large malleable iron producers.

FIG. 9—Tuyere and grate bars of cast iron containing a small amount of molybdenum

Tests for Measuring Ability Of Welders Published

Anyone concerned with the hiring of welders will be interested in the recent publication by Linde Air Products Co., 30 East Forty-second street, New York, of a 24-page illustrated booklet entitled "The Testing and Qualification of Welders." The purpose of this booklet is to outline simple tests for measuring the ability of welders, the first of the six essential steps in every procedure control for oxyacetylene welding.

It is pointed out that welding technique differs somewhat with the materials to be welded and with the type of joint used, so that it cannot be assumed that a man who can weld excellent joints in aircraft tubing can do as well in 20-inch steel pipe. Separate sections of the book discuss in detail the fracture test, the bend test, the tensile test, and the observation test.

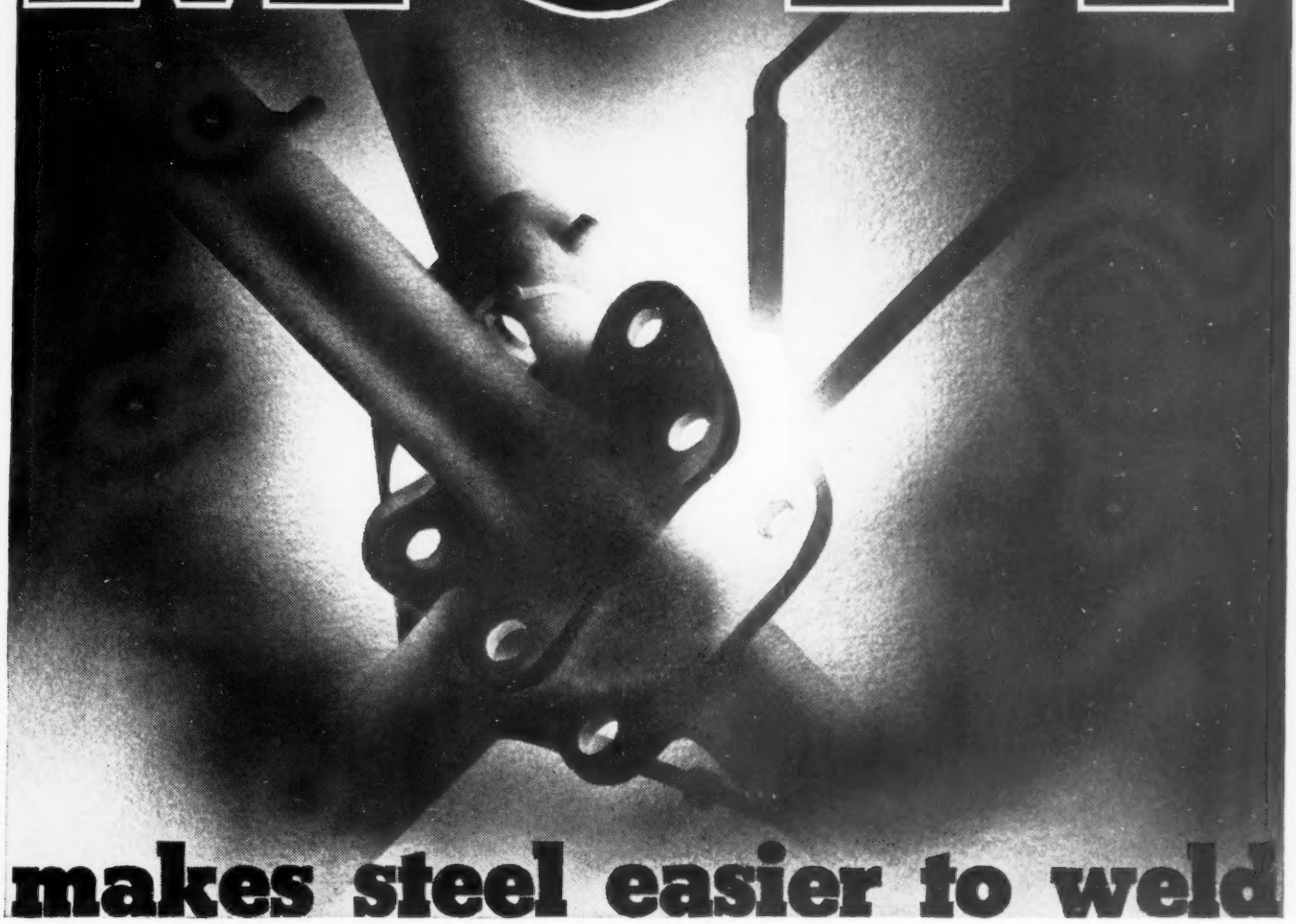
To round out the booklet, a summary of existing and pending qualification tests for welding steel plate and pipe are given. These include: The A.S.M.E. unfired pressure vessel code for both class 2 and class 3 welded constructions; the A.S.A. pressure piping code (unofficial); and the specifications and standards covering welding of steel and wrought iron pipe of the Heating and Piping Contractors National association. Copies of the booklet are available without charge from the Linde company.

Valve Springs Redesigned To Meet Exacting Demands

New developments in valve springs for internal combustion engines are discussed by Karl Pfeiffer, mechanical laboratory, Chrysler Corp., Detroit, in an article published in the June issue of *Metal Progress*. Gradual increase of engine speeds has thrown more severe demands upon valve springs and has complicated their manufacture and design. Originally made of hard drawn or patented wire of plain carbon steel, valves later were made of alloy steel, such as chrome-vanadium, S. A. E. 6150 wire. In recent years the trend has been back to carbon steel of high quality, although spring engineers are not entirely satisfied with this material.

A chief difficulty in valve springs is surge, vibration of the wire between its two ends set up by impact of valve closure. Changes in spring design have attempted to circumvent this difficulty. Another source of trouble has been corrosion fatigue which can be eliminated either by plating the spring or by improving crankcase ventilation.

MOLY



makes steel easier to weld

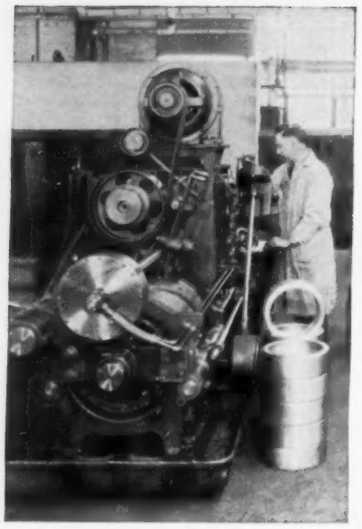
WITH welding rapidly replacing riveting, Molybdenum is being discussed more and more among those having welding problems. Today many concerns, both in the United States and abroad, are using either Molybdenum steel welding rods or welding rods coated with sufficient Molybdenum to produce an alloy steel in the weld . . . even to join plain carbon steel plates or shapes. The advantages of this practice are in the achievement of welds of higher strength and toughness than could be attained with a plain Carbon rod.

"Moly" is practically the only alloy usable in steel which does not in any way interfere with welding practice. The use of Carbon Molybdenum steel plate with a Molybdenum welding rod is the ideal combination for high-strength welded units.

The Climax Molybdenum Company has compiled much data on the strength of Molybdenum steel weld sheets. We shall be glad to give you the service of our metallurgists and our Detroit experimental laboratory to help you with your problems.

Moly always improves steel. It increases, among other properties, the ultimate strength, creep strength and resistance to wear. It produces a superior steel at a competitive initial price and often with a lower fabricating cost. Our latest publication on Molybdenum gives details. Write for it. Climax Molybdenum Co., 295 Madison Ave., New York City.

CLIMAX **Mo-lyb-den-um**



Making the Most *of* METHODS AND MATERIALS

Austenitic Cast Iron Shows Corrosion Resistance

Recognizing the need for a material of broader utility than the special close-grained, high tensile strength iron which it has been making and using in its line of heating, mixing and cooling equipment, an eastern manufacturer has succeeded in developing a new austenitic alloy cast iron which shows superior corrosion resistance. No loss in weight was shown by the new special alloy in an uninterrupted 119-day test with boiling sulphur chloride—an unusually severe corrosive agent; the high tensile strength iron lost more than 11 per cent of its original weight. The alloy contains sufficient nickel to impart the general characteristics of the austenitic irons. In addition to its unusual resistance to heat effects and the degree to which it resists a long list of acids and alkalies, the material provides protection against discoloration or contamination of caustic and similar chemicals, since it contains no copper.

s s s

Scale Color Is Indicator of Carburizing Box Life

It has been observed that differences in the life of chromium iron carburizing boxes are indicated by the color of the scale formed. This is said to be particularly true of nickel-chromium boxes. Development of a typical oxide scale forecasts relatively short life and, unfortunately, that is the common type of scale obtained. In one instance, a few boxes which turned a chocolate red were known to run as high as 7000, 8000 and 10,000 hours without showing any oxidation, as compared with usual average life of 2000 and 3000 hours. Obviously, one type of coating is protective and the other is not.

s s s

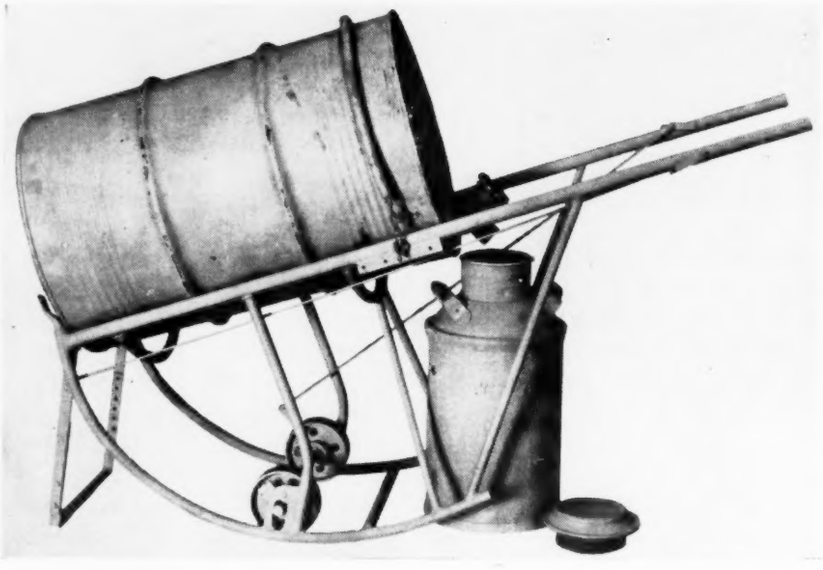
Patented Process Improves Toughness of Iron

To obtain increased toughness, ability to withstand deformation of shape without breaking, and to have malleable and nonmalleable portions in the same casting, is the subject of a recent patent. It pertains to such castings as manhole covers, etc., and employs a mixture containing 2.75 to 3.10 per cent carbon, 1.25 to 0.90 per cent silicon, 0.60 per cent phosphorus maximum, 0.20 per cent sulphur maximum, and 1.00 per cent manganese maximum. The metal is cast against a chill, and while still hot is transferred to a furnace maintained at 1650 to 1850 degrees Fahr. and held for 15 minutes to 8 hours. Then it is cooled to 1350 degrees or slightly above and held for 1 hour. Quenching in a molten lead bath at 800 degrees for 4 minutes follows, and then the casting is heated to 1300 degrees and maintained at that temperature for 2 hours, after which it is cooled.

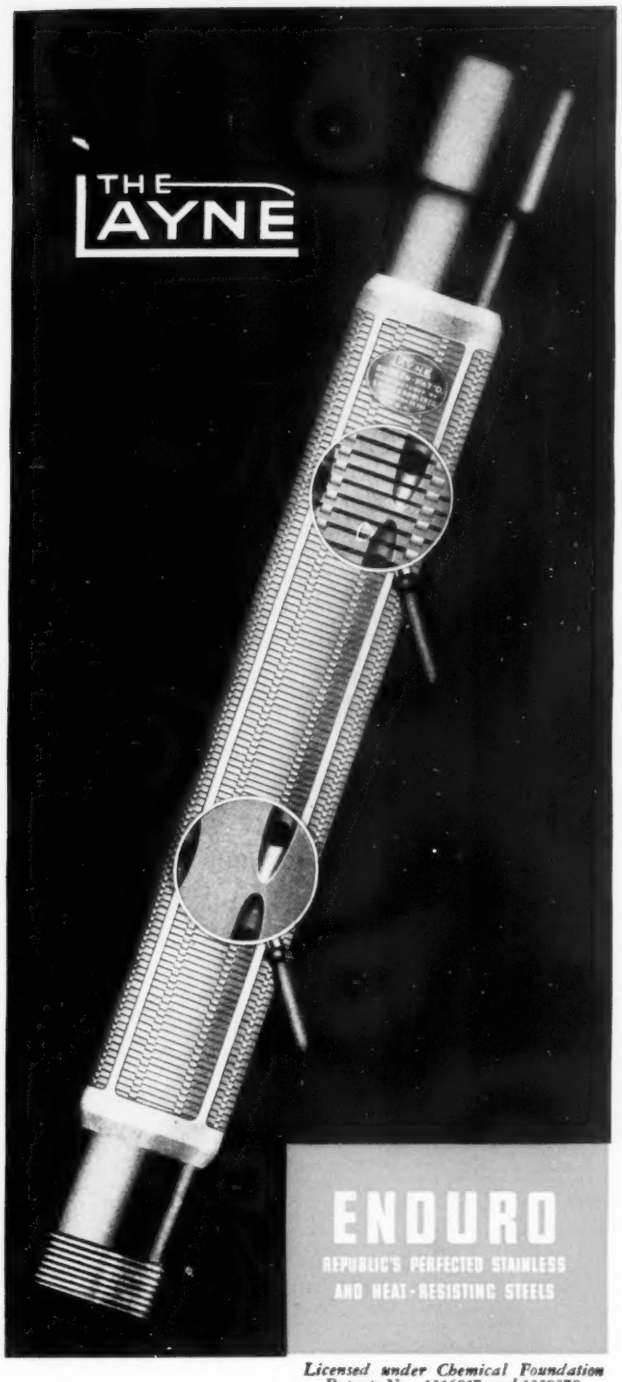
s s s

Using More Welding Rod to Build Up Worn Rail Ends

Consumption of welding electrodes in building up worn rail ends in existing track is assuming large proportions and is to be a large use for electrodes this year. Due to recent developments in welding rods, track can be reconditioned by this method



OIL BARREL HANDLING DEVICE OF WELDED TUBING: This ingenious oil barrel handling device is constructed of ½, ¾ and 1¼-inch steel tubing assembled by welding. The device is a combination of single-barrel truck and pouring stand; its use permits oil barrels to be stored on end with faucets up, to avoid leakage. The truck is run up to a vertical barrel, barrel and truck quickly and easily tipped to a horizontal position, and the load readily moved to the desired location. The truck is swung back on its rockers, the wheels retracted by means of one hand lever, and the front rest dropped into position with the other hand lever. Oil may then be drawn from the barrel safely and conveniently. The device is built by the Southwest Pump Co., Bonham, Tex., using electrodes and welding set manufactured by General Electric Co., Schenectady, N. Y.



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enduro

INTRODUCES A NEW STANDARD OF STRAINER PERFORMANCE

Through the use of ENDURO strainer wire, Layne and Bowler Co., Houston, Texas, has at last overcome that most common and expensive cause of strainer trouble—corrosion—and with the backing of Republic Steel Corporation can now say to operators in every territory—"Here's a strainer wire that will not corrode—even where salt and acid conditions are severe."

ENDURO is Republic's Perfected Stainless Steel—steel alloyed with chromium, nickel and other elements that combine to make it a truly noble metal. It is much stronger than ordinary steel. It is the same composition all the way through. It does not rust or corrode. Salt has no effect upon it. Acid cleaning does not affect it. The life of the metal should equal the life of the well in which the strainer is used.

ENDURO has found a host of other applications in the oil industry—in handling acid sludge—in fittings and valves—in pump parts and in many parts of the modern refinery equipment that is fast making obsolete the old.

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with entire satisfaction. For instance, one rod now being used in this work has a brinell hardness of about 40 points higher than the average rail hardness, and further work-hardens when car and locomotive wheels continuously pass over the deposited metal in service. While this application is a blow to rail mills, in greatly lengthening the life of old rails, it is a boon to electrode manufacturers.

\$ \$ \$

Oil Burner Field Expanding

The entrance of several large companies into manufacture of domestic and industrial oil burners is evidence of the expanding potentialities of this field. One large oil burner manufacturer predicts an increase of 50 per cent in this business this year, compared with 1933. Even half this increase would mean much in the way of tonnage and still more in dollars and cents to the producer of steel, because of the special alloys and treatment required.

\$ \$ \$

Lead Sprayed on Ship Parts

The combination of ocean atmosphere and gasoline vapors limits the efficient life of gasoline tanker ships to less than 10 years. Inspection of lead coatings sprayed on hatch covers and summer tanks in 1931 indicate a vast marine field in this connection. Cost of application compared to plate replacement is said to be less than 25 per cent.

\$ \$ \$

In castings of irregular sections, a higher phosphorus content in the iron causes segregation near the junction of the light and heavy sections. In a test, a 6-inch block cast in dry sand with iron having a 0.1 per cent phosphorus content solidified in 43 minutes, while a similar block with 1.5 per cent phosphorus content took 80 minutes to solidify.

\$ \$ \$

Because of its lower thermal conductivity, 18-8 stainless steel may be brought to a welding temperature more readily than mild steel, as the base metal will not carry away the heat so rapidly. This necessitates the use of smaller torch tips than would be utilized on the same size joint in mild steel.

\$ \$ \$

In a gray iron foundry producing 4000 duplicate castings per day, formerly involving the melting of 500 tons of iron, the elimination of four small risers totaling 10 pounds on each casting, meant a total reduction of 40,000 pounds, or 20 tons in the cupola charge.

\$ \$ \$

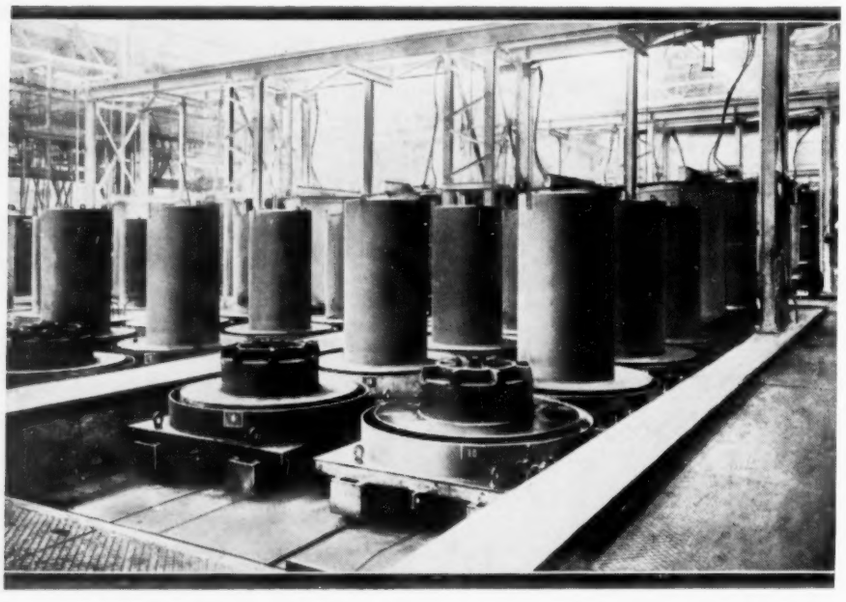
Magnesium will oxidize very easily and castings may start to burn while being heat treated. All parts must free from dust, and any substance which may start to burn. The furnace should be sealed to prevent circulation of fresh air.

Electric Annealing Effects Saving

COMPARATIVE cost figures from a typical installation show electric annealing furnaces of the bell type are effective for annealing low-carbon strip steel. Important cost items follow:

	Annealing Electric Per ton	Fuel
Hoods or pots	\$0.22	\$0.80
Electric energy, \$0.01 kw-hr.	1.31	.....
Oil, \$0.065 gal. at burners	.....	2.82
Labor	0.30	0.69
Overhead	0.30	0.69
Gas for atmosphere	0.13	.....
Iron chips	.....	0.03
General maintenance	0.03	0.09
Insurance, interest, taxes	0.32	0.26
Obsolescence	0.44	0.33
Overall cost per ton	\$3.05	\$5.71

The preceding figures represent a saving of \$2.66 per ton by annealing electrically, which is annual saving of approximately \$9000 per furnace. Most electric bell-type furnace installations pay for themselves in one and a half to four years, depending upon the duty cycle. The major saving is in the energy charge, since with the electric furnace the light-weight sheet-metal hoods and semirefractory bases offer little material to be heated other than the work.



Battery of bell-type electric furnaces for annealing coiled strip

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Treatment Inhibits Metal Corrosion

SEVERAL years ago, in an effort to reduce replacements and maintenance costs on metal parts, the Western Union Telegraph Co. tried to find some method of protection against corrosion, which would be more permanent than paint or lacquer alone. In furtherance of this effort, Dr. Leo P. Curtin, consulting chemist for the Western Union company, was delegated to make a study of this problem.

As a result of the investigation carried out by Dr. Curtin there was developed a metal treatment that is simple to handle, inexpensive and positive in its action. The ingredients consist of a powder and a solvent used in water at a temperature of approximately 150 degrees Fahr. This metal treatment has recently been made available to the trade under the name of Loxal.

Dipped, Washed and Dried

The actual treatment consists of dipping the metal parts to be treated into the solution. About 10 ounces of powder and 3 ounces of solvent per gallon of water are dissolved in an iron tank. The parts to be treated are introduced into this solution in perforated iron baskets, on racks or by conveyors or trays, and are held in this solution for a period of from 1 to 5 minutes and then are given a quick rinse in hot water, after which they are dried in open air or a warm air blast.

Little preparation is needed before treatment. Removing oil or grease

(*Please Turn to Page 47*)

WABIK METAL

Beautiful and useful products reflect the quality of the base metal as well as the craftsmanship of the designer and manufacturer. "Wabik Metal" is a base metal of proven quality in the production of vitreous enameled commodities whether of ordinary design or for parts requiring intricate and difficult drawing operations.

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New Radio Tower Uses 132 Tons of Structural Steel

THE most powerful broadcasting station in the world, WLW, the new 500,000-watt unit of the Crosley Radio Corp., Cincinnati, sends its waves out over the ether from a structural steel vertical radiator antenna which reaches into the sky to a height of 831 feet. This antenna, it is stated, is the second highest broadcasting tower in the United States and the third highest in the world. It is 273 feet higher than the Washington monument and only 153 feet short of the famous Eifel tower in Paris.

Built by the Blaw-Knox Co., Pittsburgh, and installed at the WLW transmitting station in Mason, O., 25 miles north of the studios in Cincinnati, the antenna is composed of a 700-foot high structural steel portion with a 120-foot heavy-design tubular steel flag pole on the top. The overall height of 831 feet includes the height of the central concrete pier and the base insulator upon which the tower rests. The weight of the structure proper is approximately 132 tons.

As will be observed from the accompanying illustration, the antenna is of peculiar shape. It is 35 feet square at the center and only 30 inches square at the base with the diameter at the base of the insulator bearing surface only 6½ inches. This extremely small base rests upon a seemingly fragile bit of cup-shaped porcelain 1½ inches in thickness, this porcelain base supporting a total stress load in the neighborhood of 450 tons.

Guyed by Eight Cables

The eight guys which support the structure are 1¾-inch diameter special high-strength steel bridge cable and are attached at an elevation of approximately 340 feet. Their total length is more than a mile. They were prestretched by the manufacturer to insure a uniform modulus of elasticity after erection—this was essential because the sway of the tower must be limited to a small predetermined angle to prevent any tension or shear stresses in the base insulator porcelain.

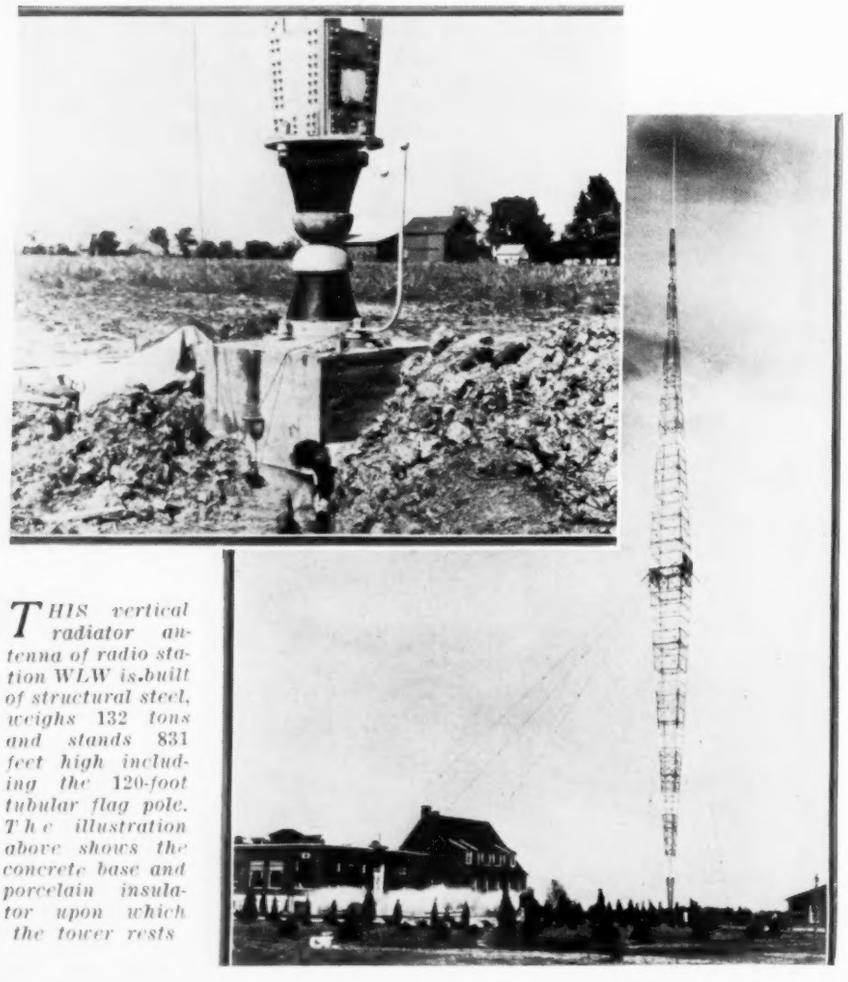
These guys are installed with an initial tension of approximately 45,000 pounds. The vertical component of this tension, as well as the entire weight of the structure, is supported by the Lapp-type base insulator. A similar unit is said to have withstood a load of 3,000,000 pounds without failure.

Insulators in Compression

Each guy contains seven Lapp-type guy insulators designed so that the porcelain always is in compression, the same as in the case of the base insulator. Four of these insulators are in series at the point of attachment to the mast and the remaining three are distributed along the length of the guy so as to break up its length into nonresonant sections and prevent interference with the radiated wave. Each of these guy insulators has an ultimate strength greater than that of the high-strength steel bridge cable.

The structure is designed to withstand a wind velocity of approximately 115 miles per hour and the loading due to this wind can be increased by 50 per cent before the elastic limit of any member of the structure is reached. This type of tower, known as the standard guyed vertical radiator, is patented by the Blaw-Knox Co.

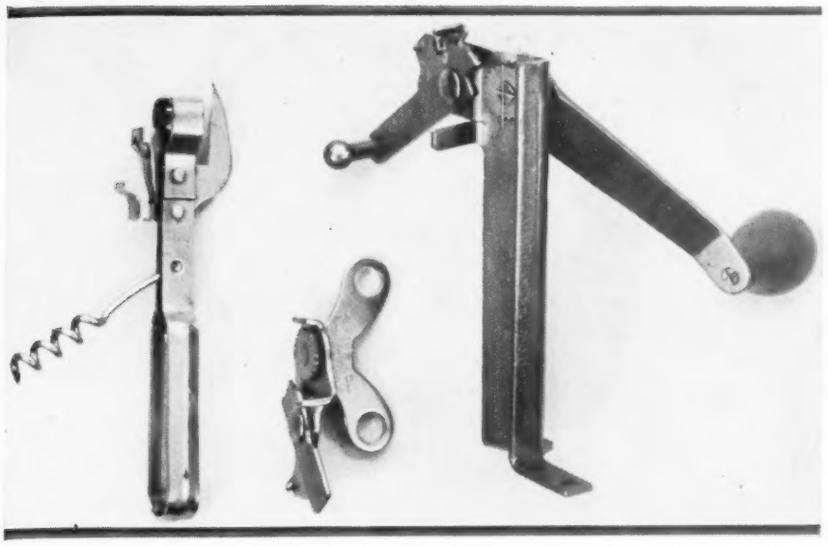
A distinct departure from the traditional type of antenna, this structure has increased the signal intensity of WLW in the service area by about 38½ per cent and has pushed out or extended considerably the area in which nonfading service exists.



THIS vertical radiator antenna of radio station WLW is built of structural steel, weighs 132 tons and stands 831 feet high including the 120-foot tubular flag pole. The illustration above shows the concrete base and porcelain insulator upon which the tower rests

Tests on Beneficiation of Raw Materials Reported

"Can refractory raw materials be beneficiated?" is the question propounded as a title for technical bulletin No. 50 of the American Refractories institute, Pittsburgh. In the bulletin's contents, J. D. Sullivan and B. M. Bird, engineers associated with Battelle Memorial institute, Columbus, O., report results of tests carried out in attempting to answer this question. The authors point out that it cannot be said *a priori* that an ore or other raw materials can or cannot be concentrated; and they outline simple laboratory methods to show the amenability of any given material to concentration. Much of the discussion is given over to description of the "float-and-sink" tests as performed on iron ore and other materials to determine possibilities of beneficiation.



Three popular types of can openers, all entirely of steel. Production of these tools runs as high as 5,000,000 annually, requiring about 300 tons of steel

LARGE USES OF STEEL IN SMALL WAYS

264th Article ◆ Can Openers

A VOTE of American housewives probably would show that the can opener is one of the most indispensable of kitchen tools. The subject of many a witticism relating to the ability of the novice engaged in the culinary art, can openers nevertheless have found a permanent place among the utensils necessary for the preparation of meals.

The rise in demand for can openers naturally has accompanied the growth in consumption of canned foods, and today it is estimated that the annual output of these tools in the United States amounts to about 5,000,000 units. While some openers are exported, the bulk of this production is for home consumption. The industry provides a market for steel producers which, while hardly comparable to that represented by the container industry, is of some importance, being placed conservatively at around 300 tons yearly. This is principally in the form of cold-rolled strip, other products used being tool steel and wire.

Can openers hardly can be termed a standardized article. While formerly they consisted almost exclusively of a blade affixed to a wood, sometimes cast iron, handle which when thrust through the can removed the lid by prying around the edge, inventive genius during recent years has produced a variety of types that rival in number the different products of the larger packers of canned foods. Today the housewife may spend from 5 cents to $5 in buying a can opener weighing from a little more than an ounce to 8 pounds, and in any event it is more than likely that her purchase will be an all-steel article.

Designs Are Numerous

Some openers are made of a combination of steel and wood, the latter material being used occasionally for handles. The prying knife type of opener also is made with a steel handle, as shown above, and may include a cork screw in the handle. This tool is made of cold-rolled steel strip, formed to shape, with the head section stamped and riveted to the handle. The blade is tool steel.

Mechanical varieties of openers now are the most popular, the leading manufacturer reporting demand for this type being ten times that for the knife brand. The former appeal to women because they are easier to operate than the latter which require more force to provide the initial piercing as well as subsequent prying of the tin plate. Illustrated are two well-known makes of the mechanical type of opener, one being provided with a bracket for permanent attachment to the wall. Both consist of a cutting blade, frame and handle, with a gear wheel attached to the handle. When a can is placed in position turning of the handle and gear wheel forces the blade into the cover and around the edge.

The smaller of these two openers weighs about 2 ounces, the other 6 ounces. Their various parts also are made of cold-rolled strip, the fabrication consisting principally of stamping operations and assembly. The cutting blades are high-carbon steel rather than tool steel. Other sizes of can openers also are available for heavy service, such as in restaurants where large containers must be opened, and these also are made largely of steel.

How Submerged Motors Were Returned to Duty

Plant operators, confronted occasionally by the submersion of electric motors through breakage of water mains, flood, fire or other emergency will be interested in the experience of a Cuban sugar mill.

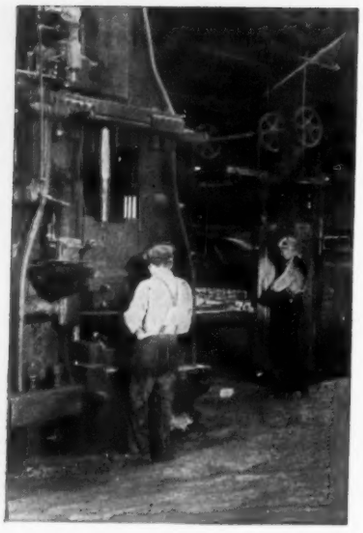
During the revolutionary troubles at Central Cespedes, Cuba, last summer and fall, the men who took over the sugar mill would not permit keeping the water pumped out of the pits in which were located three General Electric 150-horsepower motors used to drive the centrifugal injection pumps.

Afterward the motors were taken apart and dried out in an oven made around the muffler of a 150 horsepower diesel engine. After three weeks drying, an insulation resistance of five megohms was obtained. The motors were then varnished, reassembled and put in operation. They ran the full crop without any interruption or sign of trouble. Another insulation test at the end of the run still showed a resistance of five megohms.

The four and a half months of complete submersion was in extremely dirty water standing one to two feet over the tops of the motors. The motors had already operated through 13 crops, and still have their original windings.

Conveyor Screw Wear Slow

Conveyor screws, containing on the average 1.50 per cent nickel, 0.75 per cent chromium and 0.30 per cent carbon, have been in constant service in a cement mill for over 4 years, handling clinker at temperatures frequently approaching 1000 degrees Fahr. Fabricated screws used previously required replacement about every week or ten days.



PROGRESS IN STEELMAKING

STEEL billets, 4 x 4 inches, can be cleaned of scale centrifugally by the use of abrasive material at a cost of $0.93 a ton compared with $1.34 a ton when the scale removal is accomplished by pickling.

• • •

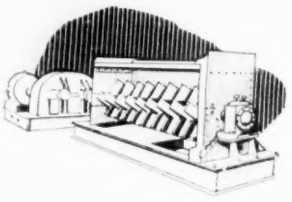
Backwashing without interfering with operation is a feature of a newly designed twin basket strainer for cleaning water used for service requirements around the steel mill and power house and for removing scale and slag from the discharge water at rolling mills and blast furnaces. The unit comprises two baskets placed at 90-degree angles to each other, and through which the flow of water is controlled by two swinging gate valves.

• • •

Hot tops for ingot molds now are being made at a Canadian open-hearth shop of crushed brickbats and a refractory material known as "Pyromite." The firebricks are broken to pass through a ¼-inch screen and then are charged into a cement mixer with the previously mentioned material which has a softening temperature of slightly over 3000 degrees Fahr. Sufficient water is added to afford a plastic mixture.

• • •

Three zones are incorporated in a newly designed static washer for cleaning blast furnace gas. In the first zone the heavier particles of dust are thrown centrifugally against the shell where they are entrapped in a water film thereon. In the second zone the gas flows through hurdle openings. In the final zone the gas enters an annular drum and divides left and right. The two streams of gas pass symmetrically 180 degrees through the drum, rejoin and pass out through a port to the washer exit. On the interior of the drum are numerous rubber vanes upon which dust and water are precipitated and definitely removed from the gas stream. The third zone of the washer removes 85 to 90 per cent of the dust not entrapped by the first two stages. The pressure drop through the washer is less than 6 inches water. Gas leaving the washer contains less than 1 grain of entrained moisture and is highly suitable for use in stoves built with 3-inch checkers and under boiler plants.



APPLICATION of a ⅛-inch bead of an abrasive-resisting material to the wearing edge of a sintering plant pug mill paddle increases its life three times.

• • •

Expansion of slag on freezing in cracks in metallurgical furnace bottoms and the resultant damage of these hearths or bottoms can be prevented by the addition of 0.5 to 5 per cent borax glass to the slag in the furnace.

• • •

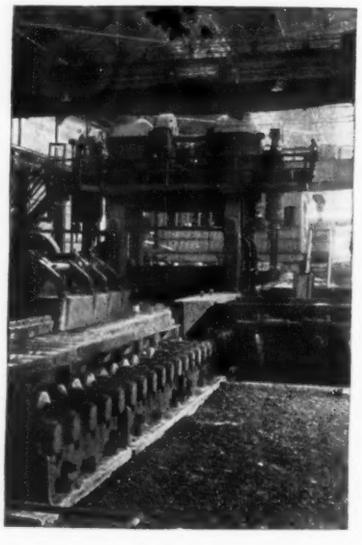
Recrystallization in transformer sheets occurs at progressively lower temperatures, the greater the degree of cold working, according to an investigation conducted abroad on the changes in grain size following cold working and subsequent heating of this grade of steel. The largest grains were obtained in steel containing 1.9 per cent silicon after an elongation in the cold state of 3 to 4 per cent and subsequent heating between 1562 and 1652 degrees Fahr., while with an increase in the silicon content maximum grain growth took place at lower degrees of deformation. Since the watt losses decrease considerably with increasing grain size, it is possible by this means to achieve a marked improvement in transformer sheets.

• • •

Rubber bonded aluminum oxide abrasive grain safety tread with the surface highly nonslip in effectiveness even at the nosing edge, now is being marketed in various colors. Unaffected by weather conditions and unusually resistant to wear, the treads are suitable for steel plate stairways installed at blowing engines, stoves, shells, gasometers and gas washers at blast furnaces; and, for stairways at coke ovens and steelworks.

• • •

Research work on a refractory paint to withstand 3000 degrees Fahr. has been completed. The heat resisting product is a thin, super-refractory film or lining for fire boxes, boiler furnaces, steel mill preheating furnaces, and similar units.



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Testing Materials Society Reviews Current Research

ENGINEERS, scientists and managers of business and public enterprise speak a common language when considering tests and specifications for materials. Even those questions of the newer relationship of government to business, the application of public funds to large undertakings and most emphatically the self-government of industry under codes, involving quality of materials, are understandable in this common language, according to discussions at the thirty-seventh annual meeting of the American Society for Testing Materials, Atlantic City, N. J., June 26-29.

Work of the society in the development of standards anticipated by more than 30 years the underlying principles of the national recovery act in reconciling to a common aim the opposing viewpoints of various groups. All of the 700 standards of specifications and tests, formulated and established by the society, have been built by the co-operative work of producers and consumers and with full representation of those who serve the public interest.

Pays Tribute to Activities

T. R. Lawson, Rensselaer Polytechnic institute, Troy, N. Y., president of the society, presented in retrospect the work and accomplishments of the organization during the year. He stressed the value of specification advancement, the stimulus of committee activity and the effectiveness of the symposium on corrosion resistance conducted during the spring committee meetings held in Washington in March.

Papers and publications carrying the results of the work of the society constitute a major contribution to all industrial and technical progress. According to C. L. Warwick, secretary, the society issued through its headquarters in Philadelphia more than 5900 pages of printed material covering proceedings, standards and tentative standards, symposiums on technical subjects and joint publications with other societies, during the calendar year of 1933.

Research projects, fostered and furthered by the society, cover a wide range of industrial problems, according to the report of Dr. H. F. Moore, University of Illinois, Urbana, Ill., chairman of the committee on research. One project of particular interest to the metal industries is a joint investigation of pig iron, under a committee made up of representatives of the A. S. T. M., American Foundrymens' association, Gray Iron institute, Malleable Iron Research institute and American Institute of Mining and Metallurgical engineers.

The question of standards, which under the practice of the society has involved the preparation of both specifications and testing methods, was reviewed by Cloyd M. Chapman, consulting engineer, New York, who mentioned the 174 changes in standards during the past year. Of this number 34 represent new tentative, 27 tentative revisions and 39 advanced to standard, embracing materials or commodities in practically every line of engineering and construction.

Hardness testing of thin specimens by the Rockwell method presents difficulties, according to R. L. Kenyon, American Rolling Mill Co., Middletown, O., who supported this contention with some interesting experimental results. Hardness tests were made on thin specimens of low-carbon killed steel specimens. The variables of thickness of specimen, smoothness of surface, lubrication of surface and ball, flatness and hardness of anvil and roughness of ball were simplified through the use of a special technique which left only the thickness as the unknown quantity. Pieces of test material, ½ x 4 inches in size, identical in structure and treatment, were hot etched in acid from 0.010-inch to 0.050-inch by steps of approximately 0.005-inch. Both top and bottom of the specimens were hand polished and etched specimens were examined microscopically.

At the start, the area surrounding the impression left by the Rockwell ball showed a ridge and as the thickness was decreased, this ridge disappeared and a depression occurred. Similarly, at a certain point, a bulge appeared on the under surface and the appearance of this bulge is evidence that the Rockwell reading is questionable. Side flow causes lower readings, anvil effect higher readings, and punching through causes lower results. Decreasing the load on the test apparatus makes it possible to obtain reliable readings on thinner pieces.

Study Phosphorus, Sulphur Effects

An important contribution to the metallurgy of steel was represented in the report of the committee on the investigation of the effect of phosphorus and sulphur on steel, presented by H. S. Rawdon, national bureau of standards, Washington. This investigation, under way for a number of years, applies to various types of commonly used structural steels, rivets, castings and the like. The present report covers the effect of phosphorus on low-carbon steel for pipe and of sulphur on forging steel.

According to the committee, four heats of 95 tons each were produced at the Lorain, O., works of the National Tube Co. and to three of these, ferrophosphorus was added in the ladle in increasing amounts. The resulting material was tested (1) as received, (2) annealed and (3) quenched, test specimens being cut longitudinally and transversely from skelp.

Increased tensile strength and percentage of elongation was noted with the increase of phosphorus in the range from 0.007 to 0.080 per cent, while the proportional limit and reduction of area relationship has not been established. The increase of phosphorus did not affect adversely behavior under cold bending in the as-received or annealed conditions, but did show detriment in quenched specimens. Greater effect was noted on the impact values, but the committee ascribed this to an abnormality as

(*Please turn to Page* 47)

Awarded Dudley Medal

EIGHTH award of the Charles B. Dudley medal of the American Society for Testing Materials, commemorating the first president of the society, was awarded to R. L. Templin, Aluminum Co. of America, New Kensington, Pa., in recognition of his contribution to scientific knowledge, through his paper on the fatigue properties of light metals and alloys. This paper was presented at the society's 1933 *annual meeting.*

New Officers

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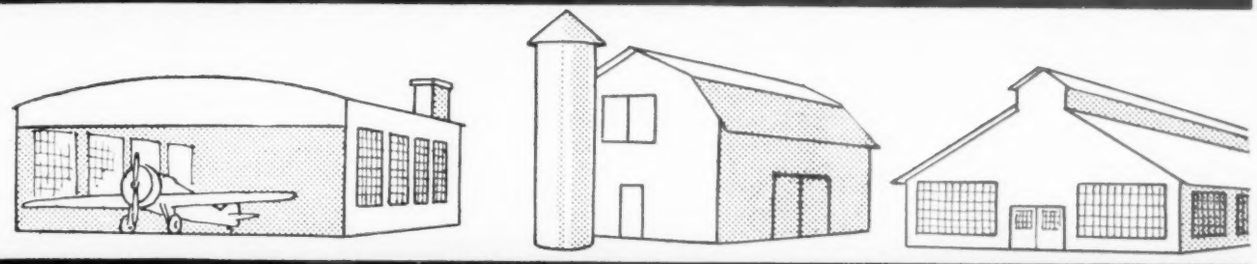

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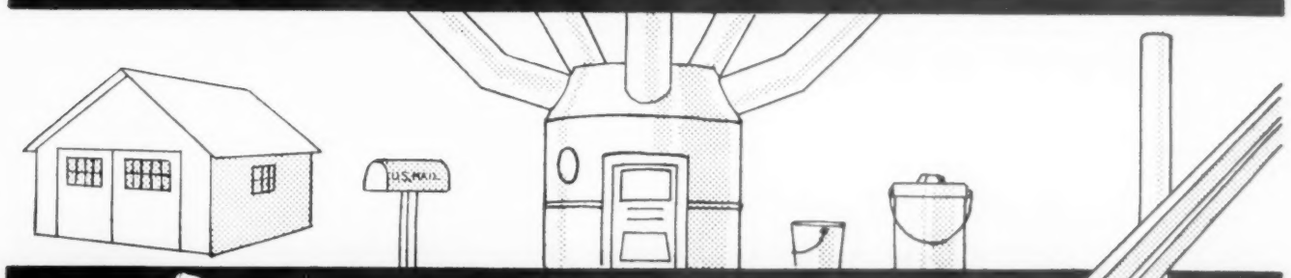

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Future Supply of High-Grade Ore Is Disturbing Factor

CONCERN over the future supply of high-grade iron ores in this country is becoming more accentuated among producers and consumers. New development of ore bodies does not begin to replace shipments. No new range of ore has been discovered in the Lake Superior district in the past 25 years. In 1915 operating mines in that district totaled 209; this number had dwindled to 161 in 1929. In the past 25 years not less than 100 ore mines have been depleted. While more high-grade iron ore may be discovered in the future, it is a question whether any new supply will offset shipments.

This warning was voiced by R. C. Allen, Cleveland, in speaking at the technical session of the Ohio section of the American Institute of Mining and Metallurgical Engineers, June 22, at the Battelle Memorial institute, Columbus, O. Mr. Allen is president, Lake Superior Iron Ore association, and executive vice president, Oglebay, Norton & Co., Cleveland, Lake Superior mine operators.

Mr. Allen, in speaking on the "Iron Ore Industry of the Lake Superior Region in Prosperity and Depression," mentioned that the rate of consumption of all minerals in the first third of this century has exceeded the development of new sources.

Conservation Is Essential

The United States no longer dominates the copper market of the world as it once did, he stated, and if some ways and means are not devised to conserve the present deposits of high-grade iron ores in this country the strength of this nation in the future will depend upon its ability to secure adequate supplies elsewhere.

Mr. Allen cited many statistical facts to stress the importance of the Lake Superior iron ore region. He said that in 1929 high-grade ores ready to be shipped, and those that could be readily beneficiated by commercial processes amounted to 1,400,000,000 tons. In the ten years prior to 1929 about 500,000,000 tons of ore was shipped from the mines in that region.

Five years ago 161 operating properties were in existence. They shipped an average of 410,000 tons each that year. In 1929 the number of men employed in the industry totaled 22,000. The money invested amounted to $300,000,000. The payroll for labor alone was $30,000,000.

Mr. Allen pointed out that iron ore constituted 58 per cent of the net bulk tonnage shipped in 1929 on the Great Lakes. The average load carried was approximately 2,750,000 pounds. About 11,000 men were required to man the iron ore fleet, and the annual payroll amounted to $10,000,000.

More thought should be given, Mr. Allen contended, toward supplying American industry in the future with iron ore mined in the United States, instead of bringing it in from sources abroad. Progress has been made in the concentration of low-grade iron ore, but the process does not yet afford a product which can compete with foreign supply. The speaker was of the opinion that blast furnace interests would not object to a price increase of $1.50 per ton on ore, but if a higher increase were put into effect blast furnaces in Youngstown district would be in a position to obtain their supply from other countries, particularly Brazil, at a more attractive figure.

Our iron ore problem is one of economics, he stated, and will continue to be economic so long as the present policies of the states of Michigan and Minnesota are continued. A disturbing influence which producers and consumers of iron ore face in the near future is the situation in Minnesota where the political party now in power and the governor have declared for confiscation of the mines in that state. Such a movement will be decided in the November election.

Another threat with which iron ore producers are faced is the contemplated St. Lawrence waterway. If this canal is built, the speaker mentioned, it will enable foreign producers to bring their ore to Great Lakes ports. Based on precedent, there apparently will be no charge for service rendered from the Atlantic ocean to the Great Lakes.

In conclusion, Mr. Allen emphasized that if the mines in the Lake Superior region are to continue in the future to supply the various blast furnaces in the Mississippi valley with iron ore, assistance from the people and government must be assured. In 1934, he said, the Lake Superior iron mines have returned to a semblance of normal operation and producers hope to move from 30,000,000 to 35,000,000 tons of ore before the year closes.

In discussing Mr. Allen's paper, a few members expressed the opinion that dwindling reserves of high-grade ore should give no cause for alarm, in view of the fact that there is an adequate supply of steel scrap in this country which continually is finding its way back into the steel plant. On the contrary, one member stated, not much scrap can be expected in the future because of the trend toward steel houses and other steel commodities which become fixed.

Traces Blast Furnace History

Many details associated with the method of smelting iron ores for several centuries before the beginning of the Christian era and from then up to the present time were depicted by slides exhibited by Charles Hart, president, Delaware River Steel Co., Chester, Pa. who spoke on "The Evolution of the Blast Furnace."

At the outset Mr. Hart mentioned that some of the ores mined in Africa contain 1 per cent antimony and others 0.5 per cent arsenic. Six large deposits of iron ore are known to exist in the world today, he stated. Passing over those in this country, the speaker mentioned those in Cuba amounting to about 3½ billion tons. Swedish deposits are magnetic. The Saar district in the western part of Europe has between six and seven billion tons. Hematite ore deposits in Newfoundland are so vast, Mr. Hart said, that no one knows how much ore is available in that field. The best estimate is between five and ten billion tons.

H. N. Eavenson, president of the American Institute of Mining and Metallurgical Engineers, was the principal speaker at an informal banquet held Friday evening at the Athletic club. In discussing "Problems of the Coal Industry with Particular Reference to Metallurgical Fuels," he mentioned that the first coal for metallurgical use in this country was shipped from Virginia in 1701.

Despite the increased efficiency in the use of coal, the speaker emphasized the fact that steel companies should endeavor to make arrangements for coal reserves for the next 50 years.

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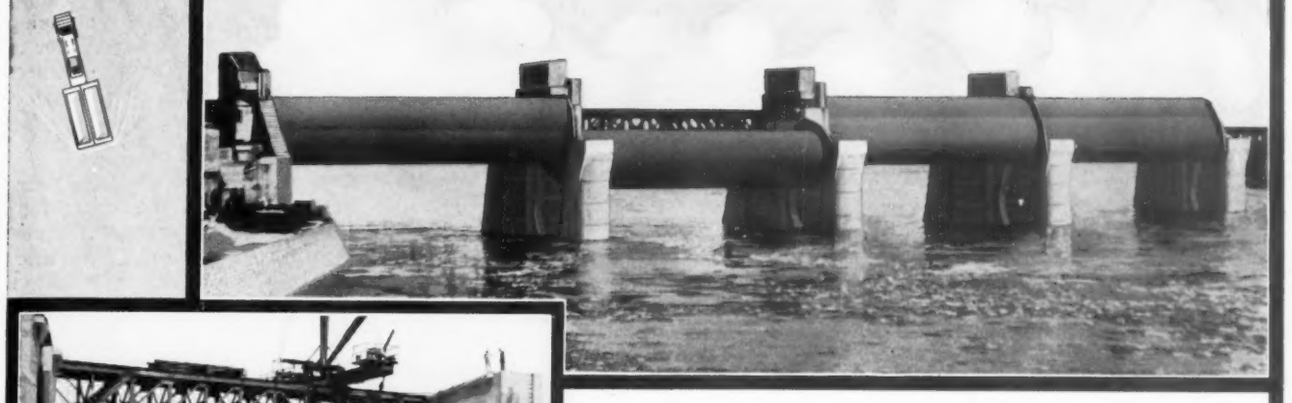
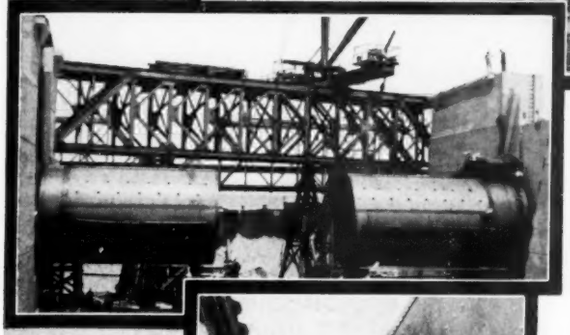
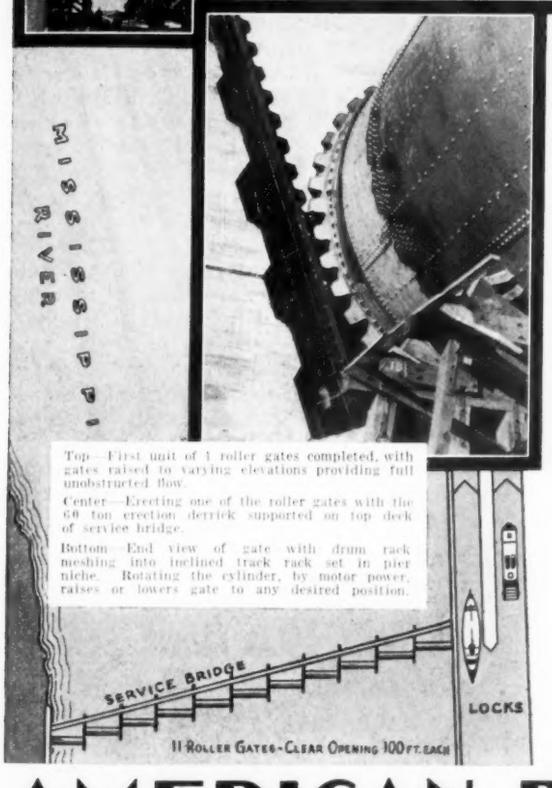
A "ROLLER-LIFT" DAM
FOR FULL BLOCKADE OR REGULATED FLOW







Top—First unit of 4 roller gates completed, with gates raised to varying elevations providing full unobstructed flow.

Center—Erecting one of the roller gates with the 60 ton erection derrick supported on top deck of service bridge.

Bottom—End view of gate with drum rack meshing into inclined track rack set in pier niche. Rotating the cylinder, by motor power, raises or lowers gate to any desired position.

THE largest roller-gate installation ever made, in total length and in number of gates, is "Dam 15" across the Mississippi at Rock Island, Illinois. Each of the eleven gates of this extraordinary structure is about 109 feet long, over all, and gives a clear opening of 100 feet between piers. Each of nine gates has a damming height of 26 feet, while the two end ones, forming the sluiceways, are not quite 22 feet high.

Each gate is a riveted steel cylinder with a permanently attached lip or apron, which when resting on the sill-slab provides an effective seal and also adds to the damming height of the cylinder. The larger cylinders have, in fact, a diameter of 19 1/3 feet and the end ones a diameter just over 16 feet. It will be seen, therefore, that the apron contributes to the damming height something over 6½ feet in the one case and 5½ in the other. Any gate can be raised and lowered independently of the others by rotating the cylinder, each end of which is provided with a drum rack to mesh with the teeth of an inclined track rack set in niches at the piers.

For maintenance, a steel service bridge extends the full length of the dam. It carries on its top deck a locomotive crane for general service use and on its bottom-chord deck a traveling crane for handling stoplogs. Eight such stoplogs, each a steel truss 106 feet long, 11½ feet deep, and about 3½ feet high, when laid flat with ends engaging vertical slots at the piers, form the upstream bulkhead for unwatering any gate that needs attention.

Dam 15 was built under immediate direction of U. S. Army Engineers. General Contractors: The S. A. Healy Co., Chicago, Ill. Contractors for the roller gates: S. Morgan Smith Co., York, Pa. All structural steel except end sections of roller gates was fabricated, and the roller gates, service bridges, and stoplogs erected throughout, by American Bridge Company.

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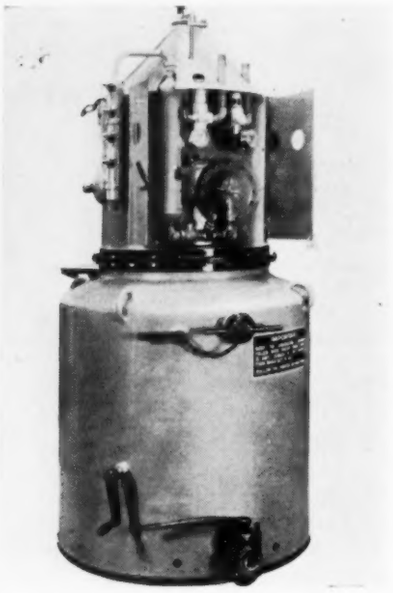
NEW EQUIPMENT

PRODUCTION FABRICATION
TREATMENT FINISHING

Portable Acetylene Generator — Linde Air Products Co., 30 East Forty-second street, New York, has announced a new type MP-4 portable acetylene generator, shown herewith.



New Oxweld type MP-4 portable acetylene generator

It is designed to withstand the abuse encountered in portable service, particularly in overland pipe construction. The capacity of this new generator is 150 pounds of ¼ x 1/12-inch (quarter size) carbide. It is rated to produce 300 cubic feet of acetylene per hour.

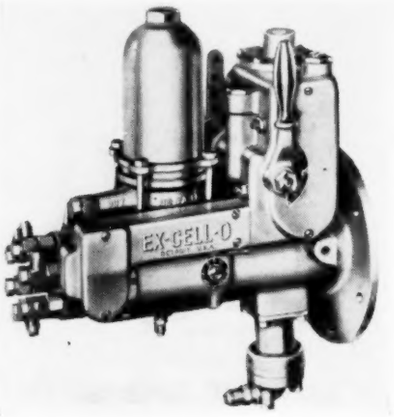
Feed is of the gravity type. Feed control unit is self-contained and is bolted to the inside of the carbide hopper. At all rates of generation, the pressure variation within the generator is not more than ¾ pounds per square inch. This slight variation is removed by means of a new type of regulator designed for this particular job.

Two relief valves are used—one on the generating chamber and the other on the hydraulic back-pressure valve. A lever-operated rod interlocks with the shaft of the feed lock, with the relief valves, and with the charging door in such a manner that the feed must be locked and the relief valves opened before the charging door can be unlocked. A simple and fool-proof filter unit is built into the rear of the regulator, so that along with the valve mechanism of the regulator it is within the hopper shell, thus protecting both of these units from mechanical damage and minimizing freezing action in cold weather.

♦ ♦ ♦

Fuel Injection Pump—Ex-Cell-O Aircraft & Tool Corp., 1200 Oakman boulevard, Detroit, is bringing out a standard fuel injection pump, shown herewith, for builders of high-speed diesel engines. The device consists of two major parts, the drive unit and the hydraulic unit. The drive unit is mounted directly on the engine, making it practically a part of the engine structure. The hydraulic unit is removable and is furnished as a sealed assembly.

Incorporated as an integral part located on top of the fuel injection pump is a secondary filtering unit.



An Ex-Cell-O fuel injection pump, flange-mounted type

The fuel oil must pass through this filter before entering the hydraulic unit. Foreign material thus is removed that might otherwise damage the system. A two-step filter is employed, the first being a specially woven wool fabric and the next a spirally wound edge filter. A fuel transfer pump is available for delivering oil to the injection pump if there is not sufficient gravity head. The fuel pump may be furnished with a governor in which can be incorporated features adapting it to automotive, marine, industrial or constant speed service.

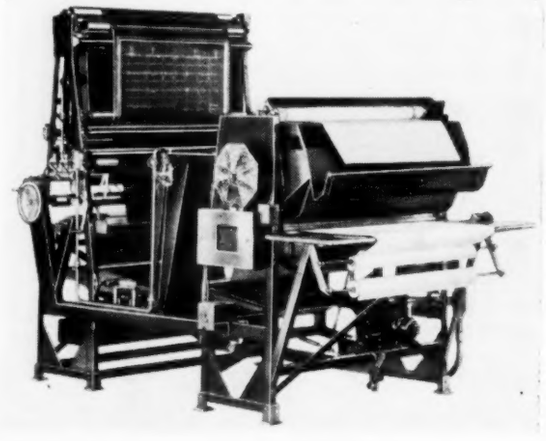
♦ ♦ ♦

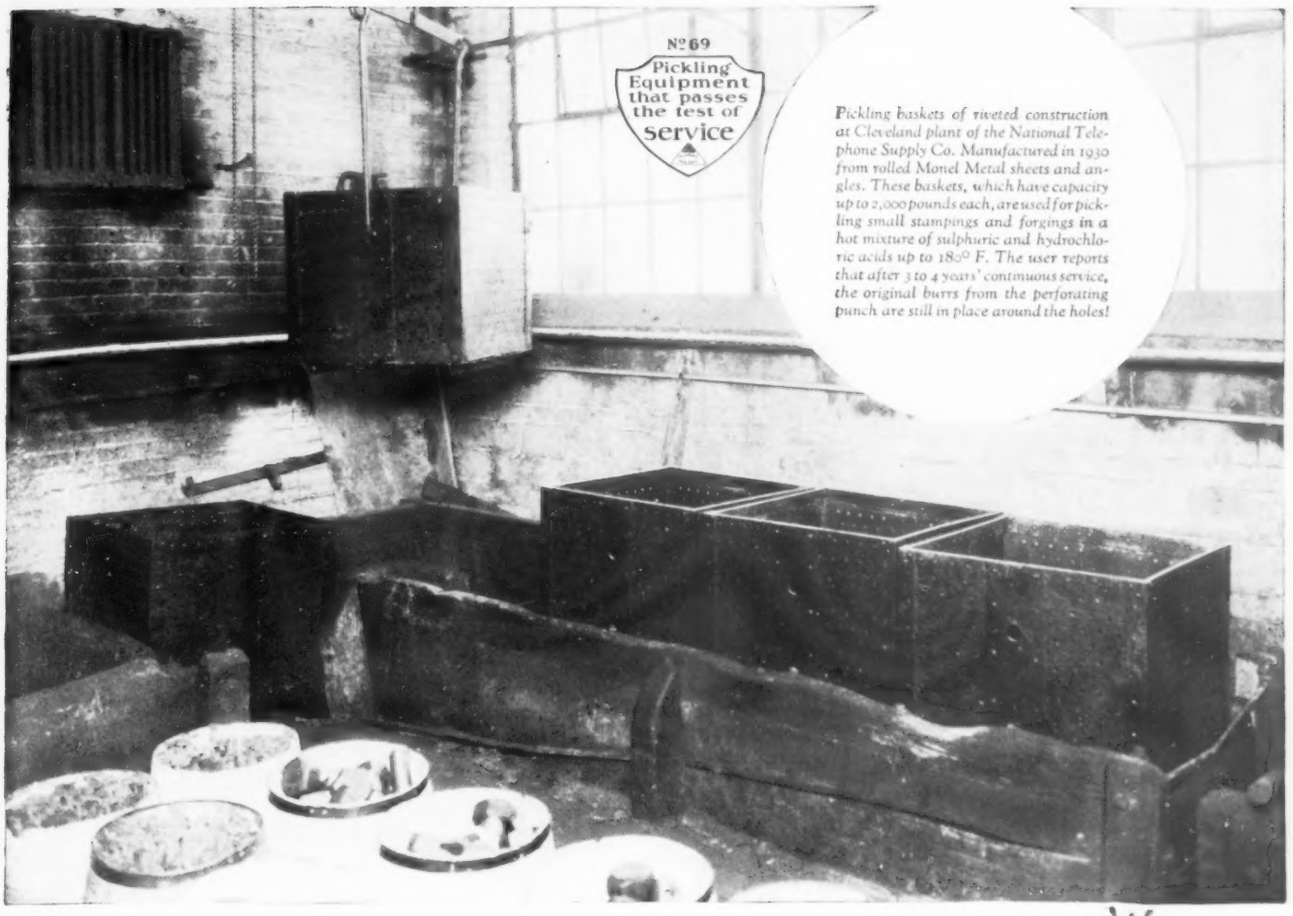
Blueprinting Machine—C. F. Pease Co., 813-821 North Franklin street, Chicago, recently brought out a new blueprinting machine designated model 11. The equipment, shown herewith, is composed of three units, a blueprinting machine, a washing unit, and a potashing and drying unit. The blueprinting machine can be operated independently from the others by means of a simple clutch adjustment. Also the blueprinting machine may be purchased separately and the washing, potashing and drying equipment added later, if desired.

Model 11 blueprinting equipment as standard is made in one size only —for paper up to 42 inches wide; however, on special order it can be built for paper up to 54 inches wide. It can be wired to operate on either 220 volts direct or alternating current and is powered with a variable speed ¼ horsepower drive motor. The lamps with which it is equipped provide a range of printing speed from 4 inches to 12 feet per minute on direct or 60 cycle alternating current.

The machine has a special gear shift underneath the feed table at the right, providing for two speeds—high and low, also neutral. Additional printing speed regulation is obtained by a special hand operated dial located at the right-hand front

PEASE model 11 blueprinting, washing and drying machine can be equipped with either a gas or electrically heated dryer. Framework is of all steel, arc welded construction. All piping and wiring is complete, ready for installation





Pickling baskets of riveted construction at Cleveland plant of the National Telephone Supply Co. Manufactured in 1930 from rolled Monel Metal sheets and angles. These baskets, which have capacity up to 2,000 pounds each, are used for pickling small stampings and forgings in a hot mixture of sulphuric and hydrochloric acids up to 180° F. The user reports that after 3 to 4 years' continuous service, the original burrs from the perforating punch are still in place around the holes!

Less Cussing...

Machinists, Heat Treaters and Enamellers turn out better work when the pickling room is equipped with Monel Metal

TAKE a forging that's all covered with gritty scale; or a casting with silica sand embedded in its surface from the mold. You know what that does to a machine tool. And what it does to the disposition of the machine operator. Also, how it affects your toolroom boss. And, incidentally, the manager who's watching costs!

Or take a part that balks every attempt of a heat treater to get even penetration...no matter how carefully he regulates his fuel or what strange mixtures he stirs into his quenching bath. Maybe forging scale or foreign deposits can't play hob with that situation.

And as for enamelling a surface which isn't cleaned right down to the quick...well, you know *that* simply can't be done.

Clean pickling is the answer in all these shops. And calls (particularly where gritty, silica scale is to be cleaned) for pickling equipment that isn't quickly eaten away—*even in a bath of hydrofluoric acid.*

Monel Metal pickling equipment saves a heap of grief, a heap of "cussing". It cuts costs because it is strong enough and *resistant* enough to stand up well under highly corrosive conditions. Which simply means that the Monel Metal itself isn't being eaten away, isn't weakening the bath unduly; *and isn't becoming rapidly embrittled in the process.* Hence, repairs are a rarity and replacements few and far between.

Why not get detailed facts on Monel Metal performance in the particular pickling job that you have in mind? We have the dope waiting for you. Write.

See the INCO *Exhibit of*
MONEL METAL
Household Appliances
at A Century of Progress, Chicago—1934
Home Planning Hall

THE INTERNATIONAL NICKEL COMPANY, INC.
67 WALL STREET NEW YORK, N. Y.

Monel Metal

Monel Metal is a registered trademark applied to an alloy containing approximately two-thirds Nickel and one-third copper. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

of the machine and connected by direct shaft to the rheostat mounted on the side frame of the printer which provides instant and accurate change of printing speed of the proper degree for any requirement.

♦ ♦ ♦

Surface Broaching Unit—Foote-Burt Co., 13000 St. Clair avenue, Cleveland, is calling attention to surface broaching with indexing fixtures on its new machine which was described in the Feb. 12 issue of STEEL. The accompanying illustration shows broach holders removed with broaches assembled for squaring both

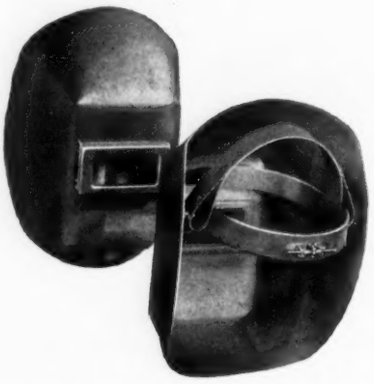
Continuous surface broaching machine developed by Foote-Burt Co.

ends of a spring shackle pin. This also depicts the indexing work holding fixtures. Pins first pass through the first set of broaches, machining two flats on each end. The additional set of broaches can be seen beneath the fixtures. After this cut, the groove on the top plate of the fixture engages the indexing pin, giving the work holding spindle one quarter turn. Work then passes through the remaining straddle broaches completing the squares and the pin is ejected automatically from the fixture.

A cam block is handled in much the same manner, the part going through the machine but once. Two broaches are used. With pieces such as a gear and castellated nut, the part would make more than one pass through the machine and would be unloaded automatically after the cuts were completed.

♦ ♦ ♦

Welding Helmet—American Optical Co., Southbridge, Mass., recently brought out a new welding helmet, shown herewith. It is particularly suited for work in confined spaces such as tanks, ship hulls, locomotive front ends, fire boxes, etc. Designed to fit closely to the face and sides of the head without sacrificing ventilation or causing light leaks, the helmet is said to be cool and comfortable under the most humid conditions. The bakelite welding glass holder is outside of the helmet and is fully di-



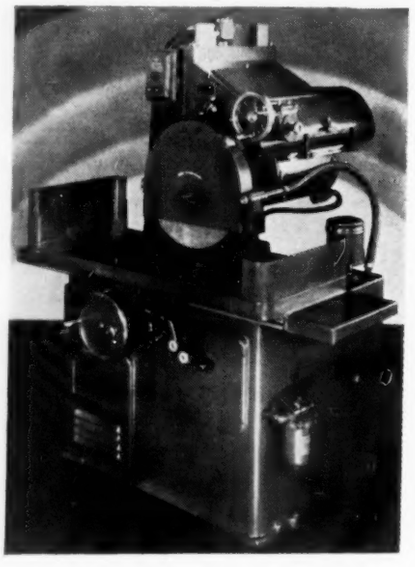
Welding helmet recently introduced by American Optical Co.

electric. It assures the wearer of freedom from burns if accidental contact is made with the electrodes while working.

Noviweld glass, which is claimed to screen out more than 99½ per cent of all injurious light rays, is standard equipment. A swivel connection between the helmet and headgear provides three positive positions in which the helmet can be set when in use.

♦ ♦ ♦

Grinding Machine — Thompson Grinder Co., Springfield, O., recently

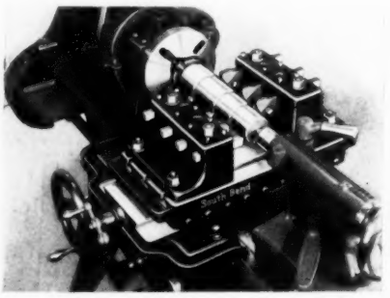


Thompson surface grinding machine for die shops has wide table

developed a new grinding machine designed particularly for die shops so that dies can be ground without necessity of removing the guide pins. It also can be used for other surface grinding operations especially where a wide capacity table is needed. The table has a 16 x 24-inch work surface and can accommodate pieces 20 inches in width inside the water guard. The grinding wheel employed is 20 inches in diameter, and is driven by a 5 horsepower motor revolving at 1140 revolutions per minute. The wheel head is equipped with power rapid traverse, power truing, and intermittent cross feed from 1/32 to ¾-inch, variable in all instances.

♦ ♦ ♦

Saddle for Engine Lathes—South Bend Lathe Works, South Bend, Ind., is marketing a special production saddle for engine lathes. The device is for use with regular 13, 16, and 18-inch swing screw cutting precision lathes. This saddle is designed for mounting special tool holding blocks for multiple tool machining work. In the accompanying illustration the saddle is shown set up for a turning and necking job. The front tool holding block holds four turning tools for turning four diameters; the rear tool block holds three parting tools for shouldering and neck-



South Bend multiple tool base saddle for engine lathes

ing. In operation the lathe is run the same as an ordinary engine lathe although performing, in this instance, seven operations.

The same multiple tool base saddle can, of course be used for a variety of multiple tool set-ups for machining to a great many shapes. Motor shafts, pump shafts and other parts having several diameters can be machined in one set-up. Also, in addition to handling multiple tool production work, the slotted table of the multiple tool base saddle may be used as a clamping table in doing milling boring, reaming, drilling, keyway cutting and other work.

A. S. T. M. High Spots Research

(Concluded from Page 40)

shown by photomicrographs. The direction of rolling exercised no influence. On the basis of tensile, shear and bending properties as determined, the phosphorus content was negligible.

F. N. Speller, National Tube Co., read a communication from W. C. Chancellor of the same company, deprecating the use of the term "abnormal" in description of some of the specimens tested, and ascribed inferior results to higher finishing temperatures in the material.

The section of the report dealing with forging steels covered a series of tests from eight heats of 50 tons each made by the Jones and Laughlin Steel Corp., wherein the carbon ranged from 0.45 to 0.50 per cent, sulphur varied from 0.03 to 0.10, and round specimens of 1, 2 and 8-inch diameter were tested.

The major influence of increasing sulphur was evident in specimens that were quenched and drawn. Here a drop in tensile strength, yield point and proportional limit was noted. A marked variation in carbon and manganese was encountered with the increase in carbon and the committee inferred that some of the variation in physical properties was due to this change rather than to sulphur alone.

Points to Red-Shortness

Prof. A. E. White, University of Michigan, Ann Arbor, Mich., presented a comment from the floor. Prof. White held that as the tests were made on cold material, the dangers of red-shortness commonly attributed to sulphur remained unexplored. He regretted that no tests were made on higher quality forging steels specified by automotive and ordinance requirements and urged calling attention in the publication of the report to the omission of data and test results covering such features.

A report of the committee on magnetic properties, presented by Thomas Spooner, Westinghouse Research Laboratories, East Pittsburgh, Pa., offered nomenclature and tentative definitions of units, symbols and terms which were passed to letter ballot of the society. Tentative methods for sampling molybdenum salts and compounds for metallurgical use were offered in the report of the committee on ferroalloys by J. P. Gill, Vanadium Alloys Steel Co., Latrobe, Pa.

Prof. H. F. Moore read a paper by Inge Lyse and C. C. Keyser, Lehigh university, Bethlehem, Pa. on the effect of size and shape of specimen upon physical properties of structural steel. The size and shape have no appreciable effect on Johnson's limit or tensile strength; the elongation in 2 inches increased with the size of the test specimen; the reduction of area of fractured section decreased with the increase of the width-thickness ratio; only slight differences in results were obtained on specimens having the full thickness of the rolled plate and those machined from the center portions of the plate. Physical properties are affected but little by the size and shape of test piece. These results were checked by R. L. Templin, Aluminum Co. of America, New Kensington, Pa., who in discussion told of experiments on aluminum specimens.

Mathematics in Steelmaking

Application of statistical methods to the metallurgical problems encountered in a steel plant formed the subject of a paper by W. C. Chancellor, National Tube Co., Lorain, O. The limits of variation to be expected in the average and standard deviation, developed mathematically, form the basis for control charts covering various steps in steel production. A set of charts developed for percentage of FeO in open-hearth finishing slags was built up from a study of 416 individual heats, grouped in 104 sets of four each. From this basis, the average and standard deviation of each sample of four was calculated.

Similarly, the effect of open-hearth practices on the surface of ingots, blooms and rounds was studied so that changes in practice such as varying the types of ingot molds and coatings could be measured and control charts were developed so that the chipping time per heat in man-hours per unit of surface was determinable. The author stated that statistical methods are useful in analyzing unsatisfactory manufacturing conditions which impair quality or result in loss of product.

Methods were suggested for determining whether variation is due to a constant system of chance causes alone or in part to correctible causes. The statistical methods are useful in identifying the latter class of cause.

Recently Developed Method Inhibits Metal Corrosion

(Concluded from Page 32)

and sometimes a brief pickling treatment, followed by rinsing in hot water, usually suffices.

Equipment required is inexpensive and requires practically no maintenance. A metal tank of requisite size, fitted with steam coils to heat the solution and with facilities for filling with water and for handling the material to be treated, are all that is necessary.

There are many advantages claimed for the coating. When metals are coated with Loxal, such parts may be stored without danger of rusting, until the manufacturer finds it convenient to apply the finishing coat. The coating also is said to act as a bonding coat, presenting a uniform surface, free from blemishes, to which the finishing coat of paint, lacquer or enamel adhere tenaciously. Should any part of the base metal become exposed the coating will inhibit the spread of rust.

The treatment is applicable to practically all types of iron and steel surfaces. The carbon content of the steel has no appreciable effect in retarding the formation of the coat, and good results have been obtained on steel objects which have been spot-welded or which carry an oxidized film on the metal surface. The same coat can be formed on cadmium, zinc and certain other metals.

There is said to be no appreciable loss as a result of precipitated sludge in the work-tank, since the addition of the solvent to the bath converts any sludge into a clear solution which automatically becomes the active coating ingredient. A further economy is that iron equipment is not harmed by the solution, and there is no danger of leaks occurring in iron tanks.

The Western Union company has made this process available to the metal industry through Curtin-Howe Corp., New York.

Trade Publications

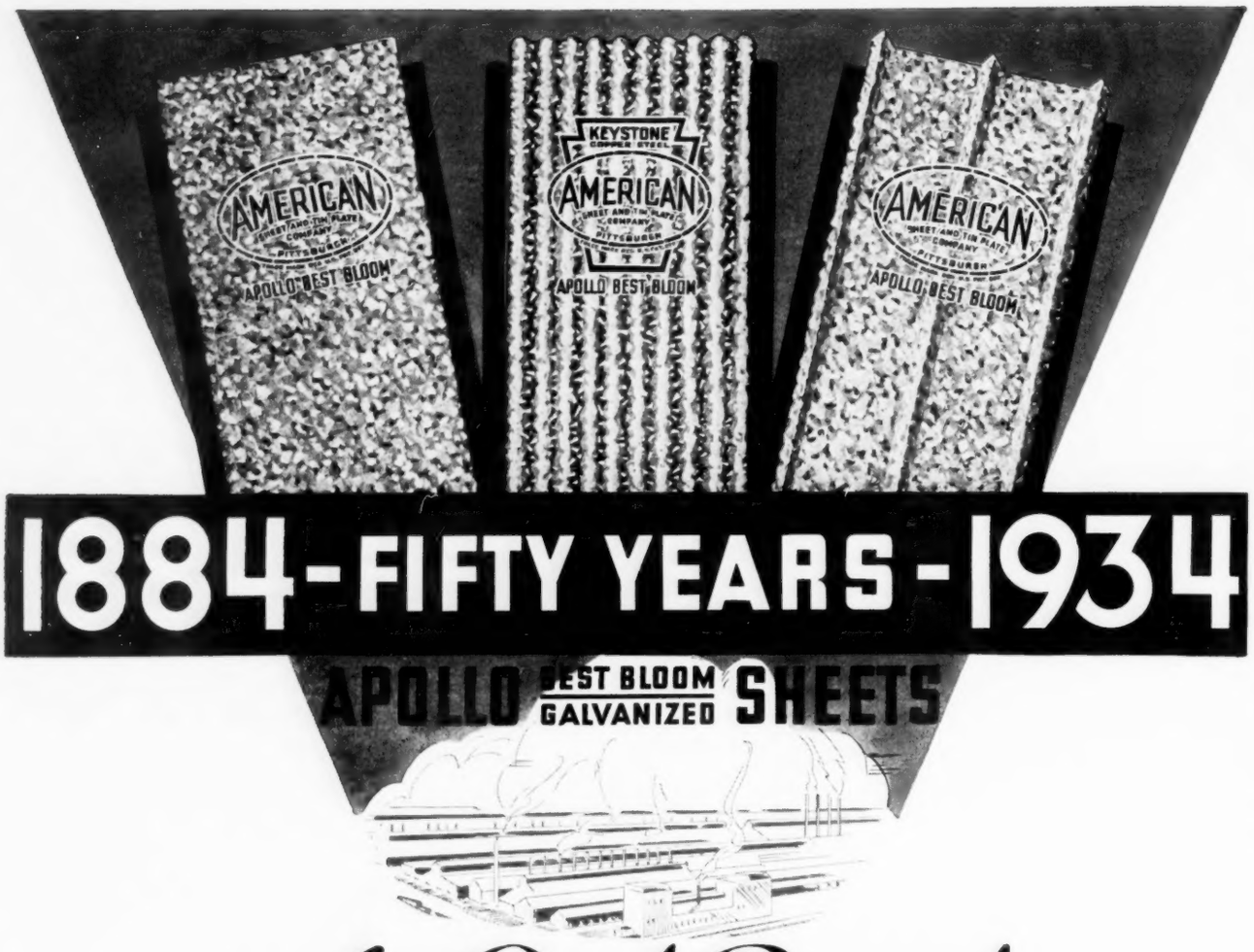
MOTORS—Direct-current motors are considered in two looseleaf sheets by the Wagner Electric Corp., 6400 Plymouth avenue, St. Louis, bulletin 167, part 8. Detailed illustrations show construction.

WRENCHES—Open-end, box, socket, pipe and special wrenches for hand or power use are described in a new catalog being distributed by the Bonney Forge & Tool Works, Allentown, Pa., No. 34A.

AIR VALVES—Instant, smooth air control and no air leaks are claims for an air valve on a new principle described in a bulletin by C. B. Hunt & Son, Salem, O. The bulletin presents detailed illustrations and a clear description of the valve and its operation.

CIRCUIT BREAKERS—Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has published a catalog on its line of small oil circuit breakers. Included are tables of the proper type of breaker, indoor, outdoor or subway, for any kilovolt-amperage needed.

AIR COMPRESSORS—Compressed air at lower cost is the suggested theme of a bulletin by the Worthington Pump & Machinery Corp., Harrison, N. J., devoted to suggestions for the use of its feather valve compressors to lower costs and improve efficiency in operation.



1884-FIFTY YEARS-1934

APOLLO BEST BLOOM GALVANIZED SHEETS

A Good Record

APOLLO BEST BLOOM GALVANIZED SHEETS

reach the *half century* mark. They are the best known Galvanized Sheets manufactured, and they did not come to such favor by accident. From 1884 until now, the most thorough and painstaking research, the best materials, and highest skill have been devoted without stint or compromise to making these sheets as good as it is possible for sheets of their type to be.

This Company produces high grade Galvanized Sheets for all uses to which zinc coated sheets may be found suitable.

AMERICAN APOLLO-KEYSTONE Sheets (alloyed with copper—a later achievement for added rust resistance), and various other special sheets and plates have since been introduced to meet the needs of industry. But to the original APOLLO Best Bloom Galvanized Sheets the palm must be given for their general acceptability, broad usefulness, and great volume of demand. Good in 1884, these sheets are even better now at their semi-centennial—which is as it should be.

You will do well to insist upon APOLLO Best Bloom. Leading metal merchants in all parts of the country sell these high quality sheets—or they can readily procure them for you. Send for literature.

US STEEL

American Sheet and Tin Plate Company

GENERAL OFFICES: Frick Building, PITTSBURGH, PA.

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

KEYSTONE AMERICAN

STEEL SHEETS for EVERY PURPOSE

Sheet, Strip, Carbon Bar Prices Are Reduced

Recent Advances for Spot Business and Third Quarter Greatly Modified—Steel Rate Down to 46 Per Cent—Fabricated Work Most Promising for July

ALL hot-rolled sheets except galvanized, all cold-rolled sheets, and hot-rolled strip and hot-rolled carbon steel bars have been reduced $1 to $4 a ton, effective July 7.

Whether adjustments become contagious throughout the entire steel price structure remains to be seen, but it is significant that the classifications thus far reduced are those mainly purchased by the automobile industry.

Despite these reductions, prices to be applied for third quarter will still be slightly higher than those at which the majority of orders for the second quarter were billed. The advances of $3 to $8 a ton on these materials announced April 15, and now largely canceled, actually affected only spot business during the past two and a half months.

No. 10 hot-rolled annealed sheets for third quarter now are 1.85c, base, Pittsburgh, a net increase of $2 a ton over the price at which most of the recent business has been shipped. No. 24 hot-rolled sheets become 2.45c, Pittsburgh, a net rise of $4. No. 10 cold-rolled sheets are 2.50c, and No. 20 are 2.95c, a net advance of $4 a ton in both instances. Hot-rolled strip is 1.85c, the net gain $2 a ton. Carbon steel bars are 1.80c, an increase of $1 a ton, instead of $3 as formerly announced.

Few Contracts for Third Quarter; Operations Down to 46 Per Cent

Concentration of buying in April and June, which ran steelworks operations up to the highest point reached since the middle of 1930, has resulted in accumulation of stocks by many leading consumers, and a general reluctance to make further commitments.

Steelmakers, by the terms of their recently revised code, are bound not to advance prices, once named, for a quarter, but may reduce them at any time. Few contracts have been entered for third quarter; these will be adjusted to the new levels.

Drastic curtailment in steelworks operations last week, as second quarter contracts were completed, brought the national average down 13 points to 46 per cent. Further sharp reductions are indicated this week as many steelworks have closed and will not resume until after July 4th, and then on slower schedules. Several important steelworks will be down all week.

Steelworks operations last week dropped 16 points to 40 per cent at Pittsburgh; 12 to 51, Chicago; 10 to 36, eastern Pennsylvania; 10 to 52, Youngstown; 12 to 64, Cleveland; 19 to 62, Wheeling; 23 to 24, Buffalo; 5 to 65, New England. Birmingham held at 55, while Detroit rose 11 to 93.

Automobile production was stepped up last week to offset the holiday this week. Ford and Hudson suspended Friday to remain down until next Monday. July output is expected to equal that of June.

Specifications for the lighter finished products apparently will not begin to flow to the mills again in any considerable volume until the latter part of July, based on steelmakers' estimates of consumers' inventories. Meanwhile, the industry relies chiefly on the heavier products, mainly plates, shapes and rails for a prop to operations.

New Construction Tonnages Heavier; Scrap Prices Are Steady

Structural shape awards for the week dropped to 17,385 tons. PWA has granted a loan to Allegheny county (Pittsburgh), Pennsylvania, for six large bridges to take a total of 30,000 tons of steel. Also, the government has released funds for 340 postoffices throughout the country, which will require 15,000 tons. New York Central railroad will take bids shortly on bridges in New York, 25,000 tons; inquiries are out for 8250 tons for a New York city pier shed; and 5200 tons for a government bridge over the Mississippi river at Moline, Ill. The navy will open bids Aug. 15 for 12 vessels, requiring 20,000 tons of steel. Two chemical companies have awarded 1200 tons of plates for tanks.

The movement of pig iron from lake furnaces in June exceeded that of April and May combined; renewed buying is not expected much before August. Three valley furnaces have been blown out. After advancing two consecutive weeks scrap prices remained stationary last week.

Iron and steel exports in May—241,753 gross tons—were nearly 20 per cent larger than in April, while imports—29,465 tons—increased 9.7 per cent.

Pending adjustments in sheet, strip and steel bar prices effective July 7, STEEL's iron and steel composite this week holds at $35.06; the finished steel composite remains $55.50; and the steelworks scrap figure, $10.37.

COMPOSITE MARKET AVERAGES

	June 30	June 23	One Month Ago June, 1934	Three Months Ago April, 1934	One Year Ago July, 1933	Ten Years Ago July, 1924
Iron and Steel Composite	$35.06	$35.06	$34.89	$34.18	$29.81	$39.78
Finished Steel Composite	55.50	55.50	55.08	53.90	47.20	63.53
Steelworks Scrap Composite	10.37	10.37	10.32	12.15	10.66	14.87

Iron and Steel Composite:—Pig iron, billets, slabs, sheet bars, wire rods, tin plate, nails, sheets, plates, shapes, bars, and black pipe. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

	June 30, 1934	June, 1934	April, 1934	July, 1933
Finished Material				
Steel bars, Pittsburgh	1.90	1.90	1.85	1.60
Steel bars, Chicago	1.95	1.95	1.90	1.70
Steel bars, Philadelphia	2.19	2.19	2.15¼	1.91
Iron bars, Terre Haute, Ind.	1.85	1.85	1.60	1.65
Shapes, Pittsburgh	1.85	1.85	1.80	1.60
Shapes, Philadelphia	2.05½	2.05½	2.01¾	1.81½
Shapes, Chicago	1.90	1.90	1.85	1.70
Tank plates, Pittsburgh	1.85	1.85	1.80	1.60
Tank plates, Philadelphia	2.03½	2.03½	1.99¾	1.79½
Tank plates, Chicago	1.90	1.90	1.85	1.70
Sheets, No. 10, hot rolled, Pitts.	2.00	2.00	1.90	1.75
Sheets, No. 24, hot ann., Pitts.	2.65	2.65	2.50	2.25
Sheets, No. 24, galvan., Pitts.	3.25	3.25	3.10	2.85
Sheets, No. 10, hot rolled, Gary	2.10	2.10	2.05	1.80
Sheets, No. 24, hot anneal., Gary	2.75	2.75	2.65	2.35
Sheets, No. 24, galvan., Gary	3.35	3.35	3.25	2.95
Plain wire, Pittsburgh	2.30	2.30	2.25	2.10
Tin plate, per base box, Pitts.	5.25	5.25	5.25	4.25
Wire nails, Pittsburgh	2.60	2.60	2.50	2.05
Semifinished Material				
Sheet bars, open-hearth, Youngs.	30.00	30.00	28.40	26.00
Sheet bars, open-hearth, Pitts.	30.00	30.00	28.40	26.00
Billets, open-hearth, Pittsburgh	29.00	29.00	27.80	26.00
Wire rods, Pittsburgh	38.00	38.00	37.20	35.00

	June 30, 1934	June, 1934	April, 1934	July, 1933
Pig Iron				
Bessemer, del. Pittsburgh	19.76	19.76	19.56	17.86
Basic, Valley	18.00	18.00	17.60	15.60
Basic, eastern, del. eastern Pa.	19.76	19.76	19.51	16.79
No. 2 foundry, del. Pittsburgh	19.26	19.26	19.06	17.36
No. 2 foundry, Chicago	18.50	18.50	18.25	16.75
Southern, No. 2, Birmingham	14.50	14.50	14.25	12.60
No. 2X, Eastern del. Philadelphia	20.63	20.63	20.38	17.28
Malleable, Valley	18.50	18.50	18.10	16.10
Malleable, Chicago	18.50	18.50	18.25	16.75
Lake Superior charcoal, del. Chi.	23.54	23.54	23.54	23.04
Gray forge, del. Pittsburgh	18.88	18.88	18.68	16.93
Ferromanganese, del. Pittsburgh	89.79	90.00	90.24	84.44
Scrap				
Heavy melting steel, Pittsburgh	$12.00	11.90	14.15	12.70
Heavy melting steel, eastern Pa.	10.50	10.40	11.50	10.55
Heavy melting steel, Chicago	9.75	9.75	11.75	10.45
No. 1 wrought, eastern Pa.	10.50	10.45	12.25	11.60
No. 1 wrought, Chicago	9.50	9.50	10.90	10.20
Rails for rolling, Chicago	11.25	11.25	12.75	11.15
Coke				
Connellsville, furnace, ovens	3.60	3.60	3.30	2.40
Connellsville, foundry ovens	4.60	4.60	4.55	2.85
Chicago, foundry, ovens, del.	9.25	9.25	9.25	8.00

Steel, Iron, Raw Material and Metals Prices

Prices conform to American Iron and Steel institute schedules. Asterisks denote price changes this week

Double dagger (††) denotes price reduction formally effective Saturday, July 7

Sheet Steel

HOT ROLLED No. 10
(24 to 48 inches wide)

††Pittsburgh, base	1.85c
††Gary, base	1.95c
††Chicago, del.	1.98c
††New York, del	2.18c
††Philadelphia, del.	2.14c
††Birmingham, base	2.00c
††St. Louis, del.	2.17c
††F.o.b. cars, dock Pacific ports	2.40c

HOT ROLLED ANN. No. 24

††Pittsburgh, base	2.45c
††Gary, base	2.55c
††Chicago, del.	2.58c
††Detroit, del.	2.65c
††New York, del	2.78c
††Philadelphia, del.	2.74c
††Birmingham, base	2.60c
††St. Louis, del	2.77c
††F.o.b. cars, dock, Pacific ports	3.05c

GALVANIZED No. 24

Pittsburgh, base	3.25c
Gary, base	3.35c
Chicago, del.	3.38c
Philadelphia, del.	3.54c
New York, del.	3.58c
Birmingham, base	3.40c
St. Louis, del.	3.57c
San Francisco, f.o.b. cars, dock	3.85c

TIN MILL BLACK No. 28

Pittsburgh, base	2.85c
Gary, base	2.95c
St. Louis, del.	3.17c

COLD ROLLED No. 10

††Pittsburgh, base	2.50c
††Gary, base	2.60c
††Detroit, delivered	2.70c
††Philadelphia, del.	2.79c
††New York, del	2.83c
††F.o.b. cars, dock, Pacific ports	3.10c

COLD ROLLED No. 20

††Pittsburgh, base	2.95c
††Gary, base	3.05c
††Detroit, delivered	3.15c
††Philadelphia, del.	3.24c
††New York, del.	3.28c

ENAMELING SHEETS

Pittsburgh, No. 10	2.60c
Pittsburgh, No. 20	3.20c

Tin and Terne Plate

Per 100-lb. box, Pittsburgh. Gary base, 10 cents higher

Tin plate, coke base contract	$5.25
Do., stock	4.90c
Long ternes, No. 24 unassorted	3.65c

Corrosion and Heat Resistant Alloys

Base, Pittsburgh

18% chrome, 8% nickel; sheets, 35c; plates, 28c; bars, 24c; hot-rolled strip, 24.50c; cold-rolled strip, 32.00c.

	A	B	C	D
Bars	17c	18.5c	21c	26c
Plates	20c	21.5c	24c	29c
Sheets	25c	28c	31c	35c
Hot strip	17c	18.5c	21c	26c
Cold strip	22.5c	24c	27c	35c

Carbon 0.12 and under; no nickel. A has chrome 15% and under. B over 15/18% inc., C over 19/23% inc., D over 23/30%.

Steel Plates

Pittsburgh, base	1.85c
New York, del.	2.13c
Philadelphia, del.	2.03½c
Boston, del.	2.25c
Buffalo, del.	2.03½c
Chicago or Gary, base	1.90c
Cleveland, del.	2.03½c
Birmingham, base	2.00c
Coatesville, base	1.95c
Sparrows Pt., base	1.95c
Pacific Coast, f.o.b. cars, dock	2.40c
St. Louis, del.	2.12c

Structural Shapes

Pittsburgh, base	1.85c
Philadelphia, del.	2.05½c
New York, del.	2.10¼c
Boston, del.	2.23½c
Bethlehem, base	1.95c
Chicago, base	1.90c
Cleveland, del.	2.03½c
Buffalo, base	1.90c
Gulf ports	2.25c
Birmingham, base	2.00c
Pacific Coast, f.o.b. cars, dock	2.40c

Bars

SOFT STEEL

††Pittsburgh, base	1.80c
††Chicago or Gary	1.85c
*Duluth, base	2.05c
††Birmingham, base	1.95c
††Cleveland, base	1.85c
Buffalo	2.00c
††Detroit, del.	1.95c
††Pacific Coast ports cars, dock, c.i.f.	2.35c
††Philadelphia, del.	2.09c
††Boston, del.	2.20c
††New York, del.	2.13c
Pitts., forg. qual	2.05c-2.55c

RAIL STEEL
To Manufacturing Trade

Pittsburgh base	1.80c
Chicago or Gary, base	1.85c
Moline, Ill., base	1.85c
Cleveland, base	1.85c
Buffalo, base	1.90c

IRON

Terre Haute, Ind....	1.85c
Chicago	1.90c
Philadelphia, base..	1.99c
Pittsburgh, refined..	2.75c-7.50c

REINFORCING

New billet, cut lengths, carlots

Pittsburgh	2.05c
Chicago, Gary, Buffalo, Cleve., Birm., Young....	2.10c
Gulf ports	2.45c
Pacific coast ports	2.50c
Philadelphia, del.	2.34c

Rail Steel

Pittsburgh, base	1.90c
Chicago, Buffalo, Cleveland, Birm., Young.....	1.95c
Gulf ports	2.30c
Pacific coast ports	2.45c

Wire Products □ □

(Prices apply to straight or mixed carloads; pool cars, or less, 10c up. 10% dis. on nail extras on straight or mixed carloads to one consignee.)

Base, Pittsburgh-Cleveland (Per 100-lb. keg)

Standard wire nails	$2.60
Cement coated nails	2.60
Galvanized nails, 15 gage and coarser	4.60c
Do., 16 gage and finer..	5.10c

(Per pound)

Polished staples	3.30c
Galvanized fence staples	3.55c
Barbed wire, galv.	3.00c
Annealed fence wire.....	2.45c
Galvanized fence wire....	2.80c
Woven wire fencing (base column, c.l.).....	$63.00
Plain wire, 6-9 gage to mfg. trade	2.30c

Anderson, Ind., Chicago up $1; Duluth up $2; Birmingham up $3.

Spring wire	3.20c

Chicago and Waukegan $1 higher. Worcester $2 higher.

Cold-Finished Carbon Bars and Shafting □ □

Base Pitts., one size, shape, grade, shipment at one time to one destination

10,000 to 19,999 lbs.....	2.10c
20,000 to 59,999 lbs.....	2.05c
60,000 to 99,999 lbs.....	2.00c
100,000 lbs. and over.....	1.97½c

Gary, Ind., Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

Alloy Steel Bars □

Hot Rolled

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.55c

Alloy S.A.E.	Alloy Diff.	Alloy S.A.E.	Alloy Diff.
2000	0.25	3100	0.55
2100	0.55	3200	1.35
2300	1.50	3300	3.80
2500	2.25	3400	3.20

4100 .15 to .25 Mo.....0.50
4600 .20 to .30 Mo. 125-1.75 Ni. 1.05
5100 .80-1.10 Cr. 0.45
5100 Cr. spring .....base
6100 bars 1.20
6100 spring 0.70
Cr., Ni., Van. 1.50
Carbon van. 0.95
9250.....carbon base plus extras

Strip and Hoops □

Hot strip to 23⅞-in.

Pittsburgh	2.00c
Chicago, base.....	2.10c
Birmingham, base	2.15c
Detroit, delivered	2.20c
Phila., delivered..	2.29c
New York, del.....	2.33c
Cooperage hoop, Pittsburgh	2.10c
Chicago	2.20c
Cold-rolled strip, Pitts., Cleve.	2.80c
Worcester, Mass.	3.00c

Rails, Track Material □

(Gross Tons)

Standard rails, mill	$36.37½
Relay rails, Pitts.	
*24-45 lbs.	$27.00
*50-60 lbs.	$24.00
70-75 lbs.	$18.00
80-85 lbs.	$25.00
100 lbs.	$26.00
Light rails, billet qual., Pitts., Chi..	$35.00
Do., reroll. qual...	$34.00
Angle bars, mills....	2.55c
Spikes, R. R. base..	2.40c
Track bolts, base....	3.55c
Tie plates, base	1.90c

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs., up $8; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

Bolts and Nuts □ □

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots. Dec. 1, 1932, lists.

CARRIAGE BOLTS

All sizes, cut thread .....70 off	
Rolled thread, ½ x 6 and smaller .....70 off	

MACHINE BOLTS

All sizes, cut thread, lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts, stud bolts, without nuts .....70 off	
Tire bolts .....60 off	
Stove bolts, 75 off in pkgs.; 83 off in bulk, 15,000 or more of a size.	
Rolled thread machine bolts, ½ x 6 and smaller. 70 off	
Step bolts .....66 off	
Elevator bolts .....66 off	

NUTS

Semifinished .....70 off	
Milled .....80-10-10 off	
Upset 1-in. smaller .....85 off	

SQUARE HEAD SET SCREWS

Upset, 1-in., smaller....75-10 off	
Do., larger than 1-in..75-10 off	
Headless set screws .....75 off	

Rivets, Wrought Washers

Struc., c. l., Pittsburgh, Cleveland	3.00c
Struc., c. l., Chicago	3.10c
⅞-in. and smaller, Pitts., Chi., Cleve..70 and 5 off	
Wrought washers, Pitts., Chi., Phila..	6.00 off

Cut Nails □ □

Cut nails, Pitts.; (10% discount on size extras)	$2.75
Do. less carloads, 5 kegs or more, no discount on size extras	$3.05
Do. less than 5 kegs; no discount on size extras	$3.20

Piling □ □

Pittsburgh	2.15c
Chicago, Buffalo	2.25c

Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads. Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

BUTT WELD

In.	Steel Blk.	Steel Gal.
¼ and ⅜	53½	35
½	58½	47
¾	62	52
1—3	64	55
Iron		
½	31½	15
¾	36½	20½
1—1¼	39½	25½
2	41½	26

LAP WELD

	Steel	
2	60	51
2½—3	63	54
3½—6	65	56
7 and 8	64	54
9 and 10	63½	53½
Iron		
2	37	22½
2½—3½	38	25
4—8	40	28½

LINE PIPE

	Steel
⅛-inch, butt weld	50½
¼—⅜, buttweld	52½
½, butt weld	57½
¾, butt weld	61
1—3, butt weld	63
2-inch, lap weld	59
2½ –3, lap weld	62
3½ --6, lap weld	64
7 –8, lap weld	63
Iron	
⅛—1½-inch, black and galv. take 4 pts. over; 2½—6-inch 2 pts. over discounts for same sizes, standard pipe lists. 8—12-inch, no extra.	

BOILER TUBES

C. L. Discounts, f.o.b. Pitts.

Lap Weld Steel		*Charcoal Iron*	
2—2¼	33	1¾	8
2½—2¾	40	2—2¼	13
3	47	2½—2¾	16
3¼—3½	50	3	17
4	52	3¾—3½	18
4½—5	42	4	20
		4½	21

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 2000 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 pounds, two points under base only.

SEAMLESS BOILER TUBES

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

Seamless Tubing □

Cold drawn; f.o.b. mill disc.

100 ft. or 150 lbs.....	32%
15,000 ft. or 22,500 lbs.....	70%

Cast Iron Water Pipe □

Class B Pipe—Per Net Ton

6-in. & over, Birm..	$37.00-39.00
4-in., Birmingham..	41.00-42.00
4-in., Chicago	49.00-50.00
6 to 24-in., Chicago..	46.00-47.00
6-in & over, east. fdy.	42.00
Do., 4-in.	45.00

Class A pipe $3 over Class B. Stnd. fitgs., Birm. base..$100.00

Semifinished Steel □

BILLETS AND BLOOMS

4 x 4-inch base; gross ton

Pitts., Chi., Cleve., and Youngstown..	$29.00
Philadelphia	34.30
*Duluth	31.00
Forging, Pitts., Chi. and Buffalo	34.00
*Forging, Duluth....	36.00

SHEET BARS

Pitts., Cleve., Young., Chi., Buff., Canton, O.	30.00

SLABS

Pitts., Cleve., Young.	29.00

WIRE RODS

Pitts., Cleveland	38.00
Chicago	39.00
Worcester, Mass.	40.00

SKELP

Pitts., Chicago	1.70c

Coke □ □ □

Price Per Net Ton

BEEHIVE OVENS

Connellsville fur.....	3.60- 3.85
Connellsville fdry...	4.60
Connell. prem. fdy...	5.35
New River fdry.....	6.00
Wise county fdry...	4.25- 5.00
Wise county fur....	3.50- 4.25

BY-PRODUCT FOUNDRY

Newark, N. J., del.	8.71- 9.31
Chi., ov., outside del.	8.50
Chicago, del.	9.25
New England, del...	10.50
St. Louis, del.	9.25
Birmingham, ovens	6.00
Indianapolis, del.....	8.75
Cincinnati, del.....	9.30
Cleveland, del.	9.25
Buffalo, ovens	7.50- 8.00
Detroit, ovens	8.50
Philadelphia, del.....	9.00

Coke By-Products □

Per gallon, producers' plants.

Tank lots

	Spot
Pure benzol	$0.19
90 per cent benzol	$0.19
Toluol	0.30
Solvent naphtha.....	0.26
Commercial xylol....	0.26

Per lb. f.o.b. New York

Phenol (200 lb. drums)..	0.163c
Do. (100 lbs.)	0.173c

Eastern Plants, Per Pound,

†Naphthalene flakes and balls, in bbl. ..	6.00

Per 100 lb. Atlantic seaboard

Sulphate of ammonia	$1.25

†Western prices ¼-cent up.

Pig Iron

Delivered prices do not include switching charges except as noted No. 2 foundry iron is 1.75-2.25 silicon; 25-cent differentials apply for each 0.25 silicon above 2.25. Gross tons.

BASING POINTS:	No. 2 Fdry.	Malleable	Basic	Bessemer
Bethlehem, Pa.	$19.50	$20.00	$19.00	$20.50
Birdsboro, Pa.	19.50	20.00	19.00	20.50
Birmingham, Ala., southern del.	14.50	.....	13.50	19.00
Buffalo	18.50	19.00	17.50	19.50
Chicago	18.50	18.50	18.00	19.00
Cleveland	18.50	18.50	18.00	19.00
Detroit	18.50	18.50	18.00	19.00
Duluth	19.00	19.00	.....	19.50
Erie, Pa.	18.50	19.00	18.00	19.50
Everett, Mass.	19.50	20.00	19.00	20.50
Granite City, Ill.	18.50	19.00	18.00	.....
Hamilton, O.	18.50	18.50	18.00	19.00
Jackson, O.	20.25	20.25	19.75	.....
Neville Island, Pa.	18.50	18.50	18.00	19.00
Provo, Utah	17.50	.....	17.00	.....
Sharpsville, Pa.	18.50	18.50	18.00	19.00
Sparrows Point, Md.	19.50	.....	19.00	.....
Swedeland, Pa.	19.50	20.00	19.00	20.50
Toledo, O.	18.50	18.50	18.00	19.00
Youngstown, O.	18.50	18.50	18.00	19.00
DELIVERED FROM BASING POINTS:				
Akron, O., from Cleveland	19.76	19.76	19.26	20.26
Baltimore from Birmingham	20.02	.....	19.90	.....
Boston from Birmingham	19.62	.....	19.50	.....
Boston from Everett, Mass.	20.00	20.50	19.50	21.00
Boston from Buffalo	20.00	20.50	19.50	21.00
Brooklyn, N. Y., from Bethlehem	21.77	22.27	.....	.....
Brooklyn, N. Y., from Bmghm.	21.39	.....	.....	.....
Canton, O., from Cleveland	19.76	19.76	19.26	20.26
Chicago from Birmingham	†18.72	.....	18.60	.....
Cincinnati from Hamilton, O.	19.51	19.51	19.01	.....
Cincinnati from Birmingham	19.13	.....	19.01	.....
Cleveland from Birmingham	18.62	.....	18.50	.....
Indianapolis from Hamilton, O.	20.77	20.77	20.27	21.27
Mansfield, O., from Toledo, O.	20.26	20.26	19.76	20.76
Milwaukee from Chicago	19.50	19.50	19.00	20.00
Muskegon, Mich., from Chicago, Toledo or Detroit	21.40	21.40	20.90	21.90
Newark, N. J., from Birmingham	20.51	.....	.....	.....
Newark, N. J., from Bethlehem	20.89	21.39	.....	.....
Philadelphia from Birmingham	19.88	.....	19.76	.....
Philadelphia from Swedeland, Pa.	20.26	20.76	19.76	.....
Pittsburgh dist. from Neville Island	(Neville Island base, plus 63c, 76c and $1.13 switching chgs.)			
Saginaw, Mich., from Detroit	20.60	20.60	20.10	21.10
St. Louis from Granite City, Ill.	19.00	19.50	18.50	.....
St. Louis from Birmingham	18.62	.....	18.50	.....
St. Paul from Duluth	20.94	20.94	.....	21.44

†Over 0.70 phos.

LOW PHOS.

Basing Points: Birdsboro, Pa., Steelton, Pa., and Standish, N. Y.—$23.50. Basing Point: †Johnson City, Tenn.—$23.50 †Off grade material is $19.50

Philadelphia, standard and copper bearing..... 24.63

GRAY FORGE		CHARCOAL	
Valley furnace	18.25	Lake Superior fur.	21.00
Pitts. dist. fur.	18.25	Do. del. Chicago	24.04

SILVERY†

Jackson County, O., base; 6%—$22.75; 7—$23.75; 8—$24.75; 9—$25.75; 10—$26.75; 11—$27.75. Buffalo base prices $1.25 higher.

BESSEMER FERROSILICON†

Jackson County, O., base; 10%—$27.75; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25. Buffalo base prices $1.25 higher.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Iron Ore □ □

LAKE SUPERIOR ORE
Gross ton, 51½% Lower Lake Ports

Old range bessemer	$4.80
Mesabi nonbess.	4.50
High phosphorus	4.40
Mesabi bessemer	4.65
Old range nonbess.	4.65

EASTERN LOCAL ORES
Cents, unit, del. E. Pa.

Foundry and basic, 56-63% con. (nom.)	8.00- 9.00
Cop.-free low phos. 58-60% (nom.)	10.00-10.50

FOREIGN ORE
Cents per unit, f.a.s. Atlantic ports (nominal)

Foreign manganiferous ore, 45.55% iron, 6-10% man.	10.00
No. Afr. & low phos.	9.50
Swedish basic, 65%	9.00
Swedish low phos...	9.50
Spanish No. Africa basic, 50 to 60%..	9.00
Tungsten, spot, sh. ton unit, duty pd.	$17.25-17.75
N. F. fdy., 55%.....	7.00
Chrome ore, 48% gross ton, c.i.f.....	$18.00

Manganese Ore □

(Nominal)

Prices, not including duty, cents per unit, cargo lots.

Caucasian, 52-55%	24.00
So. African, 52%....	24.00
So. Afr., 49-51%....	22.00
Indian, 58-50%	nominal
Indian, 48-50%	nominal

Refractories □ □

Per 1000 f.o.b. Works

FIRE CLAY BRICK
First Quality

Pa., Ill., Ky., Md., Ga., Mo.	$45.00
Alabama	48.00

Second Quality

Pa., Ill., Ky., Md., Mo., Ga., Ala.....	40.00

Ohio

First quality	$40.00
Intermediary	36.00
Second quality	25.00

MALLEABLE BUNG BRICK

All bases	50.00

SILICA BRICK

Pennsylvania	$45.00
Joliet, E. Chicago....	54.00
Birmingham, Ala....	52.00

MAGNESITE

Dead burned grain, Chester, Pa., Baltimore bases, net	40.00
Domes, Chewelah, Wash., base	22.00

BASIC BRICK
Net ton, f.o.b. Baltimore, Plymouth Meeting, Pa. Chester, Pa.

Magnesite brick	$65.00
Chrome brick	45.00
Chemically bonded magnesite	55.00

Fluorspar, 85-5 □ □

Washed gravel, duty paid, tide, net ton	$19.00
Washed gravel, f.o.b. Ill., Ky., net ton, carloads	$17.00

Ferroalloys □ □

Dollars, except Ferrochrome

Ferromanganese, 78-82% tidewater, duty paid	85.00
Do., Balti. base..	85.00
Do., del. Pittsburgh	89.79
Spiegeleisen, 19-20%, dom. fur. spot†..	26.00
Ferrosilicon 50%, freight all., cl.	77.50
Do., less carload..	85.00
Do., 75 per cent..	126-130.00
Spot, $5 a ton higher.	
Silicomang., 2½ carb.	90.00
2% carbon	95.00
1% carbon	105.00
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. con. del.	10.00
Ferrotungsten, stand., lb. cont. del.	1.35- 1.45
Ferrovanadium, 35 to 40% lb., cont., on analysis	2.70- 2.90
Ferrotitanium, c. l., prod. plant, frt. allow., net ton	137.50
Spot, 1 ton, frt., allow., lb.	7.00
Do., under 1 ton..	7.50
Ferrophosphorus, per ton, c. l., 17-19%, Rockdale, Tenn., basis, 18%, $2 unitage	42.00
Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage	55.00
Ferromolybdenum, stand. 50-60%, lb.	0.95
Molybdate, lb. cont.	0.80

†Carloads, Quan. diff. apply.

Nonferrous Mill Products

F.o.b. mill base, cents per lb. except as specified. Copper, brass products based on 9.00c *Conn. copper*

Sheets	
Yellow brass (high)	14.50
Copper, hot rolled....	16.00
Lead, cut, to jobbers	7.75
Zinc, 100-lb. base....	9.00
Tubes and Pipes	
High yellow brass..	17.00
Seamless copper	17.25
Rods	
High yellow brass..	13.00
Copper, hot rolled..	13.25
Anodes	
Copper untrimmed..	13.75
Wire	
Yellow brass (high)	15.00

Old Metals □ □

Deal, buying prices, cents lb.

No. 1 Composition Red Brass	
*New York	4.75- 5.00
Chicago	4.50- 4.75
Cleveland	5.00- 5.50
St. Louis	4.75- 5.00
Heavy Copper and Wire	
*New York	6.25- 6.50
Chicago, No. 1	6.25- 6.50
Cleveland	6.00- 6.25
St. Louis	5.50- 5.75
Composition Brass Borings	
New York	4.62½-4.87½
Light Copper	
*New York	5.12½-5.37½
Chicago	5.00- 5.25
*Cleveland	5.00- 5.50
St. Louis	4.75- 5.00
Light Brass	
Chicago	2.50- 2.75
Cleveland	2.75- 3.25
Lead	
*New York	2.87½-3.12½
*Cleveland	2.75- 2.85
Chicago	2.75- 3.00
St. Louis	3.00- 3.15
Zinc	
New York	2.00- 2.25
Cleveland	2.00- 2.25
St. Louis	2.50- 2.75
Aluminum	
Clips, soft, Clev.	11.50-12.50
Borings, Cleveland..	6.00- 6.25
Mixed, cast, Cleve..	9.25- 9.75
Mixed cast, St. L.	9.00-10.00

Secondary Metals □

Brass ingot, 85-5-5-5	8.75
Stand. No. 12 Alum.	15.00

Iron and Steel Scrap Prices

Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated

HEAVY MELTING STEEL

Birmingham	9.00-10.00
Boston, dealers	5.75- 6.00
Buffalo, No. 1	11.00-11.50
Buffalo, No. 2	9.50-10.00
Chicago, No. 1	9.50-10.00
Cleveland, No. 1	9.00- 9.50
Cleveland, No. 2	8.50- 9.00
Detroit, No. 1	8.00- 8.50
Detroit, No. 2	7.00- 7.50
Eastern Pa.	10.50
Eastern Pa., No. 2	9.00- 9.50
Federal, Ill.	6.75- 7.00
Granite City, R. R.	7.50- 8.00
Granite City, No. 2	6.50- 7.00
N. Y., deal. R. R.	7.00- 8.00
N. Y., deal. No. 2	5.50- 6.50
Pittsburgh, No. 1	11.75-12.25
St. Louis	6.75- 7.00
Valleys, No. 1	11.50-12.00

COMPRESSED SHEETS

Buffalo, dealers	9.50-10.00
Chicago, factory	8.50- 9.00
Cleveland	8.50- 9.00
Detroit	8.00- 8.50
E. Pa., new mat.	9.50-10.00
Pittsburgh	11.25-11.75
St. Louis	5.00- 5.50
Valleys	11.00-11.50

BUNDLED SHEETS

Buffalo	7.00- 7.50
Cincinnati, del.	6.50- 7.00
Cleveland	7.00- 7.50
Pittsburgh	10.25-10.75
St. Louis	4.00- 4.25

SHEET CLIPPINGS LOOSE

Chicago	5.00- 5.50
Cincinnati	5.00- 5.50
Detroit	4.50- 5.00
St. Louis	3.75- 4.25

STEEL RAILS, SHORT

Birmingham	10.50-11.50
Buffalo	13.00-13.50
Chicago (3 ft.)	11.00-11.50
Chicago (2 ft.)	11.50-12.00
Cincinnati, del.	10.50-11.00
Detroit	10.00-10.50
Pitts., open-hearth, 3 ft. and less	14.00-14.50
St. Louis, 2 ft.& less	9.50-10.00

STEEL RAILS, SCRAP

Boston	5.75- 6.00
Chicago	9.50-10.00
Pittsburgh	11.75-12.25

STOVE PLATE

Birmingham	7.00- 8.00
Boston, dealers	3.25- 3.75
Buffalo	8.50- 9.00
Chicago, net	7.00- 7.50
Cincinnati, dealers	5.00- 5.50
Detroit, net	6.00- 6.50
Eastern Pa.	8.50- 9.00
N. Y., deal. fdry.	6.00
St. Louis	6.00- 6.50

COUPLERS, SPRINGS

Buffalo	13.00-13.50
Chicago, springs	11.00-11.50
Eastern Pa.	13.50-14.00
Pittsburgh	13.75-14.25
St. Louis	8.00- 8.50

ANGLE BARS—STEEL

Chicago	10.50-11.00
St. Louis	7.75- 8.25

LOW PHOSPHORUS

Buffalo, billets and bloom crops	13.00-14.00
Cleveland, billet, bloom crops	13.00-13.50
Eastern Pa. crops	15.00-15.50
Pittsburgh, billet, bloom crops	14.50-15.00
Pittsburgh, sheet bar crops	13.50-14.00

FROGS, SWITCHES

Chicago	9.50-10.00
St. Louis, cut	8.00- 8.50

SHOVELING STEEL

Chicago	9.50-10.00
Federal, Ill.	6.75- 7.00
Granite City, Ill.	6.75- 7.00

RAILROAD WROUGHT

Birmingham	6.50- 7.00
Boston, dealers	6.00- 6.50
Buffalo, No. 1	7.50- 8.00
Buffalo, No. 2	11.00-11.50
Chicago, No. 1 net	8.25- 8.75
Chicago, No. 2	9.50-10.00
Cincinnati, No. 2	7.50- 8.00
Eastern Pa.	10.50
N. Y., No. 1 deal.	7.25- 7.75
St. Louis, No. 1	6.50- 7.00
St. Louis, No. 2	7.50- 7.75

SPECIFICATION PIPE

Boston	4.50- 4.75
Eastern Pa.	9.00
New York, dealers	3.50- 3.75

BUSHELING

Buffalo, No. 1	9.50-10.00
Chicago, No. 1	8.50- 9.00
Cinci., No. 1 deal.	6.00- 6.50
Cincinnati, No. 2	7.00- 7.25
Cleveland, No. 2	7.00- 7.25
Detroit, No. 1 new	7.00- 7.50
Valleys, new No. 1	11.00-11.50

MACHINE TURNINGS

Bimingham	4.50- 5.00
Boston, dealers	1.75- 2.00
Buffalo	4.50- 5.00
Chicago	5.50- 6.00
Cincinnati, dealers	4.50- 5.00
Cleveland	5.00- 5.50
Detroit	4.50- 5.00
Eastern Pa.	5.50- 6.00
New York, dealers	2.00- 2.50
Pittsburgh	7.50- 8.00
St. Louis	4.00- 4.50
Valleys	7.50- 8.00

BORINGS AND TURNINGS

For Blast Furnace Use

Boston, dealers	3.25- 3.50
Buffalo	6.00- 6.50
Cincinnati, dealers	4.50- 5.00
Cleveland	5.50- 6.00
Detroit	5.50- 6.00
Eastern Pa.	6.00
New York, dealers	1.50- 1.75
Pittsburgh	7.25- 7.75

CAST IRON BORINGS

Birmingham, plain	4.50- 5.00
Boston, chemical	8.50- 9.00
Boston, dealers	3.25- 3.50
Buffalo	6.00- 6.50
Chicago	5.50- 6.00
Cincinnati, dealers	4.50- 5.00
Cleveland	6.00- 6.50
Detroit	5.50- 6.00
E. Pa., chemical	12.00-15.00
New York, dealers	1.50- 1.75
Pittsburgh	7.25- 7.75
St. Louis	4.00- 4.25

PIPE AND FLUES

Cincinnati, dealers	4.75- 5.25

RAILROAD GRATE BARS

Buffalo	6.50- 7.00
Chicago, net	6.75- 7.25
Cincinnati	4.50- 5.00
Eastern Pa.	8.50
New York, dealers	5.00- 5.50
St. Louis	4.00- 4.50

FORGE FLASHINGS

Boston, dealers	3.75- 4.25
Buffalo	9.50-10.00
Cleveland	8.00- 8.50
Detroit	6.50- 7.00

FORGE SCRAP

Boston, dealers	4.00- 4.50
Chicago, heavy	11.00-11.50
Eastern Pa.	9.50-10.00

ARCH BARS, TRANSOMS

St. Louis	10.00-10.50

AXLE TURNINGS

Boston, dealers	4.50- 5.00
Buffalo	9.00- 9.50
Chicago, elec. fur.	8.50- 9.00
Cleveland	6.00- 6.50
Eastern Pa.	11.00
St. Louis	6.00- 6.25

STEEL CAR AXLES

Birmingham	10.00-10.50
Boston, ship, point.	9.00- 9.50
Buffalo	13.00 13.50
Chicago, net	10.75-11.25
Eastern Pa.	14.00-15.00
St. Louis	10.00-10.50

SHAFTING

Boston, ship point.	10.50-10.75
Eastern Pa.	16.00
New York, dealers	10.75-11.25
St. Louis	11.00-11.50

CAR WHEELS

Birmingham, iron	8.50- 9.00
Boston, iron deal.	6.50- 6.75
Buffalo, iron	12.25-12.75
Buffalo, steel	13.00-13.50
Chicago, iron	10.00-10.50
Chicago, rolled steel	10.50-11.00
Cincinnati, iron	8.00- 8.50
Eastern Pa., iron	11.50-12.00
Eastern Pa., steel	13.50-14.00
Pittsburgh, iron	11.25-11.75
Pittsburgh, steel	13.75-14.25
St. Louis, iron	7.50- 8.00
St. Louis, steel	8.00- 8.50

NO. 1 CAST SCRAP

Birmingham	10.00-10.50
Boston, No. 2	5.50- 6.00
Boston, tex. con.	10.50-11.00
Buffalo, cupola	9.50-10.00
Buffalo, mach.	11.50-12.00
Chicago, agri. net	7.50- 8.00
Chicago, mach. net	8.50- 9.00
Chi., railroad net	8.00- 8.50
Cinci., mach. cup	9.50-10.00
Cleveland, cupola	11.75-12.25
Detroit, net	8.50- 9.00
Eastern Pa., cupola	12.00
Pittsburgh, cupola	13.00-13.50
San Francisco, del.	13.50-14.00
Seattle	7.00- 8.50
St. Louis, No. 1	7.00- 7.50
St. L., No. 1 mach.	8.50- 9.00

HEAVY CAST

Boston, del.	5.50- 5.75
Buffalo, break.	8.00- 8.50
Cleveland, break.	7.50- 8.00
Detroit, break.	6.50- 7.00
Detroit, auto net	9.00- 9.50
Eastern Pa.	10.50
N. Y., No. 1, deal.	7.00- 7.50
N. Y., break. deal.	6.50- 7.00
Pittsburgh	10.00-10.50

MALLEABLE

Boston, consum.	12.50-12.75
Buffalo	12.00-12.50
Chicago, R. R.	10.50-11.00
Cincinnati, agri. del.	8.00- 8.50
Cinci., R. R. del.	9.00- 9.50
Cleveland, rail	11.50-12.00
Detroit, auto	8.50- 9.00
St. Louis, R. R.	8.25- 8.75
Eastern Pa., R. R.	11.50-12.00

RAILS FOR ROLLING

5 feet and over

Birmingham	10.00-11.00
Boston, dealers	7.00- 7.25
Buffalo	12.00-12.50
Chicago	11.00-11.50
Eastern Pa.	12.00-13.00
New York, dealer	7.50- 8.00
St. Louis	9.00- 9.50

LOCOMOTIVE TIRES

Chicago (cut)	11.00-11.50
St. Louis, No. 1	9.50- 10.00

LOW PHOS. PUNCHINGS

Buffalo	13.75-14.25
Chicago	11.00-11.50
Eastern Pa.	14.50-15.00
Pittsburgh	13.50-14.00

Nonferrous Metal Prices of the Week

Spot unless otherwise specified. Cents per pound

	Copper Electro., del. Conn.	Copper Lake, del. Midwest	Copper Casting, refinery	Straits Tin New York Spot	Straits Tin New York Futures	Lead N. Y.	Lead East St. L.	Zinc St. L.	Aluminum 98-99%	Antimony Spot, N. Y.	Ingot Nickel
June 23	9.00	9.12½	8.75	51.00	51.05	4.00	3.85	4.20	*22.90	7.80	36.00
June 25	9.00	9.12½	8.75	51.25	51.25	4.00	3.85	4.20	*22.90	7.80	36.00
June 26	9.00	9.12½	8.75	50.75	51.80	4.00	3.85	4.20	*22.90	7.80	36.00
June 27	9.00	9.12½	8.75	51.10	51.15	4.00	3.85	4.25	*22.90	7.75	36.00
June 28	9.00	9.12½	8.75	51.30	51.35	3.85	3.70	4.35	*22.90	7.75	36.00
June 29	9.00	9.12½	8.75	51.12½	51.17½	3.75	3.60	4.30c	*22.90	7.75	36.00

*Nominal range 19.00c to 22.90c.

Warehouse Iron and Steel Prices

Cents per pound for delivery within metropolitan districts of cities specified

STEEL BARS	
Baltimore*	3.00c
Boston††	3.05c
Buffalo	2.95c
Chattanooga	3.41c
Chicago	3.05c
Cincinnati	3.25c
Cleveland	3.05c
Detroit	3.13½c
Houston	3.00c
Los Angeles	3.70c
New Orleans	3.40c
New York‡(d)	3.32c
Pittsburgh(h)	3.00c
Philadelphia*	3.00c
San Francisco	3.60c
Seattle	3.60c
St. Louis	3.29c
St. Paul	3.00c
Tulsa	3.25c

IRON BARS	
Portland	3.40c
Baltimore*	3.00c
Chattanooga	3.41c
Chicago	2.75c
Cincinnati	3.25c
New York‡(d)	3.32c
Philadelphia*	3.00c
St. Louis	3.29c
Tulsa	3.25c

REINFORC. BARS	
Buffalo	1.95c
Chattanooga	3.41c
Chicago	2.10c-2.60c
Cleveland (c)	1.97½c
Cincinnati	3.10c
Houston	3.25c
Los Ang., cl.	2.15c
New Orleans	3.50c
Pitts., plain(h)	3.15c
Pitts., twisted squares (h)	3.27½c
San Francisco	2.45c
Seattle	3.50c
St. Louis	3.44c
Tulsa	3.25c
Young.	2.30c-2.60c

SHAPES	
Baltimore*	3.00c
Boston††	3.22c
Buffalo	3.20c
Chattanooga	3.61c
Chicago	3.25c
Cincinnati	3.45c
Cleveland	3.36c
Detroit	3.45c
Houston	3.00c
Los Angeles	3.70c
New Orleans	3.60c
New York(d)	3.42c
Philadelphia*	3.00c
Pittsburgh(h)	3.20c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.49c
St. Paul	3.25c
Tulsa	3.50c

PLATES	
Baltimore*	3.00c
Boston††	3.23c
Buffalo	3.20c
Chattanooga	3.61c
Chicago	3.25c
Cincinnati	3.45c
Cleveland, ¼-in. and over	3.36c
Detroit	3.30c
Detroit, ¾-in.	3.65c
Houston	3.00c
Los Angeles	3.70c
New Orleans	3.60c
New York(d)	3.45c
Philadelphia*	3.00c
Phila. floor	5.00c
Pittsburgh(h)	3.20c
Portland	3.55c
San Francisco	3.55c
Seattle	3.55c
St. Louis	3.49c
St. Paul	3.25c
Tulsa	3.50c

NO. 10 BLUE	
Baltimore*	3.20c
Boston††	3.40c
Buffalo	3.10c
Chattanooga	3.51c
Chicago	3.20c
Cincinnati	3.35c
Cleveland	3.26c
Det., 8-10 ga.	3.28½
Houston	3.35c
Los Angeles	3.80c
New Orleans	3.70c
New York	3.42c
Portland	3.75c
Philadelphia*	3.20c
Pittsburgh(h)	3.10c
San Francisco	3.75c
Seattle	3.75c
St. Louis	3.44c
St. Paul	3.45c
Tulsa	3.70c

NO. 24 BLACK	
Baltimore*†	3.76c
Boston (g)	4.15c
Buffalo	3.25c
Chattanooga	4.41c
Chicago	4.10c
Cincinnati	4.25c
Cleveland	4.16c
Detroit	4.185c
Los Angeles	4.35c
New York	4.05c
Philadelphia*†	3.80c
Pittsburgh**	3.80c
Portland	4.40c
San Francisco	4.40c
Seattle	4.40c
St. Louis	4.34c
St. Paul	3.695c
Tulsa	4.75c

NO. 24 GAL. SHEETS	
Baltimore*†	4.36c
Buffalo	4.00c
Boston (g)	4.75c
Chattanooga	5.01c
Chicago (h)	4.70c
Cincinnati	4.85c
Cleveland	4.76c
Detroit	4.85c
Houston	4.40c
Los Angeles	5.05c
New Orleans	4.95c
New York	4.25c
Pitts.** (h)	4.30-4.60c
Portland	5.00c
San Francisco	5.00c
Seattle	5.00c
St. Louis	4.94c
St. Paul	4.19c
Tulsa	5.10c
Philadelphia*†	4.40c

BANDS	
Baltimore*	3.30c
Boston††	3.40c
Buffalo	3.30c
Chattanooga	3.76c
Chicago	3.45c
Cincinnati	3.60c
Cleveland	3.51c
Detroit, ¾-in. and lighter	3.53½c
Houston	3.25c
Los Angeles	3.90c
New Orleans	3.95c
New York(d)	3.77c
Philadelphia	3.30c
Pittsburgh(h)	3.85c
Portland	3.90c
San Francisco	4.05c
Seattle	3.90c
St. Paul	3.20c
Tulsa	3.45c
St. Louis	3.69c

HOOPS	
Baltimore	2.80c
Boston	4.40c
Buffalo	3.55c
Chicago	3.45c
Cincinnati	3.60c
Det., No. 14 and lighter	3.53½c
New York	3.77c
Philadelphia	3.55c
Pittsburgh(h)	3.85c
Seattle	5.60c
St. Paul	3.75c

COLD FIN. STEEL	
Baltimore (c)	3.71c
Boston	4.00c-4.50c
Buffalo (h)	3.55c
Chattanooga*	4.06c
Chicago (h)	3.50c
Cincinnati	3.70c
Cleveland (h)	3.50c
Detroit	3.63½c
Los Ang.(f)(d)	5.95c
New Orleans	4.30c
New York	3.92c-4.42c
Philadelphia	3.73c
Pittsburgh(h)	3.45c
Portland (f)	4.75c
San Fran.(f)(d)	5.95c
Seattle (f)(d)	4.75c
St. Paul	3.20c
St. Louis	3.74c
Tulsa	4.65c

COLD ROLL. STRIP	
Boston, 0.100-in., 500 lb. lots	5.35c
Buffalo	5.25c
Chicago (b)	3.45c
Cincinnati	5.80c
Cleveland (b)	3.20c
Detroit	3.33c
Philadelphia	4.00c
New York	4.70c
St. Louis	5.74c

(b) Plus straightening, cutting and quantity differentials.
(c) Plus mill, size and quantity extras.
(d) Minus quant. diff.
(e) New mill classif.
(f) Rounds only.
(g) 50 bundles or over.
(h) Outside delivery, 10c less.

‡Domestic bars.
*Plus quan. extras.
**Under 25 bundles.
*†50 or more bundles.
†New extras apply.
††Base 40,000 lbs. extras on less.

Prices at Detroit, Cleveland, Chicago, Pittsburgh, Cincinnati, Chattanooga, New York, Boston, St. Louis on heavier lines are subject to new quantity differentials:

399 pounds and less, up 50 cents; 400 to 9999 pounds, base; 10,000 to 19,999 pounds, 15 cents under; 20,000 to 39,999 pounds, 25 cents under; 40,000 pounds and over, 35 cents under base.

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, June 28

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

	British gross tons U. K. ports £ s d		Continental Channel or North Sea ports, metric tons Gold parity, $4.8665 £ s d	£ s d
PIG IRON				
Foundry, 2.50-3.00 Silicon	$15.21	3 0 0	$7.55	1 11 0
Basic bessemer	13.69	2 14 0*	7.30	1 10 0
Hematite, Phos. .03-.05	15.34	3 0 6	....	.....
SEMIFINISHED STEEL				
Billets	$27.89	5 10 0	$11.44	2 7 0
Wire rods, No. 5 gage	39.55	7 16 0	21.90	4 10 0
FINISHED STEEL				
Standard rails	$39.29	7 15 0	$26.77	5 10 0
Merchant bars	1.70c	7 10 0	.69c to .72c	3 2 6 to 3 5 0
Structural shapes	1.67c	7 7 6	.68c	3 1 6
Plates, †¼ in. or 5 mm.	1.81c	8 0 0	.91c	4 2 6
Sheets, black, 24 gage or 0.5 mm.	2.09c	9 5 0	1.21c to 1.24c	5 10 0 to 5 12 6
Sheets, gal., 24 gage, corr.	2.54c	11 5 0	1.43c	6 10 0
Bands and strips	1.86c	8 5 0	.88c	4 0 0
Plain wire, base	2.09c	9 5 0	1.18c	5 7 6
Galvanized wire, base	2.37c	10 10 0	1.38c to 1.40c	6 5 6 to 6 7 6
Wire nails, base	2.71c	12 0 0	1.27c	5 15 0
Tin plate, box 108 lbs.	$ 4.37	0 17 3	.....	.....

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d 4($3.74) f.o.b.

Domestic Prices at Works or Furnace—Last Reported

	£ s d		French Francs		Belgian Francs		Reich Marks	
Fdy. pig iron, Si. 2.5	$17.11	3 7 6(a)	$12.54	190	$14.51	310	$24.73	65
Basic bessemer pig iron	16.48	3 5 0*	12.21	185	13.57	290	27.28 (b)	69.50
Furnace coke	4.44	0 17 6	7.92	120	5.15	110	7.56	19.25
Billets	27.89	5 10 0	28.38	430	20.59	440	37.88	96.50
Standard rails	1.86c	8 5 0	2.10c	700	2.31c	1,100	2.35c	132
Merchant bars	1.94c	8 12 0	1.68c	560	1.16c	550	1.96c	110
Structural shapes	1.98c	8 15 0	1.65c	550	1.16c	550	1.91c	107.50
Plates, †¼-in. or 5 mm.	1.92c	8 10 0	2.10c	700	1.47c	700	2.26c	127
Sheets, black	2.37c	10 10 0§	2.55c	775‡	1.65c	775‡	2.56c	144‡
Sheets, galv., corr., 24 ga. or 0.5 mm.	2.94c	13 0 0	4.50c	1,500	3.15c	1,500	6.58c	370
Plain wire	2.20c	9 15 0	3.39c	1,100	2.31c	1,100	3.08c	173
Bands and strips	2.37c	10 10 0	1.95c	700	1.47c	700	2.26c	127

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price. British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel. (a) del. Middlesbrough. (b) hematite

Bars

Bar Prices, Page 50

Pittsburgh—Filing of a new price on steel bars with the American Iron and Steel institute at New York makes the price 1.80c, Pittsburgh, $2 per ton below the 1.90c previously filed, which was an increase of $3 over the 1.75c level earlier in the year.

Bar demand has been subsiding sharply for the past ten days although shipments up until late last week were the heaviest of any weekly period in four years and June will show a comparable shipping rate. Some third-quarter contracts have been booked but specifications are not looked for before another two weeks. Most bar producers in this district closed finishing mills last week.

Cleveland — Additional contracts for third quarter have been placed here at the new price of 1.95c, base, Cleveland, for commercial steel bars, but the tonnage is relatively light. Further buying by automobile manufacturers, railroads and miscellaneous users is expected this month.

Chicago—Bar specifications reflect the expiration of contracts, and business for third quarter delivery has yet to appear in volume. Some orders have been booked but in the absence of price advances, consumers generally are not interested in contracting. While automotive consumption is well maintained, the tendency in bar consumption generally is downward. Farm implement manufacturers experience seasonal quiet but are hopeful of the future.

Boston—While consumers of steel bars have not stocked heavily they have sufficient to indicate light purchasing this month. Commercial steel bars now are 2.30c, Boston.

New York—The outlook in commercial steel bars is quiet. Sellers look for little improvement in buying before August, asserting that most consumers covered for the present with specifications under last quarter contracts. Prices are 1.90c, Pittsburgh, or 2.23c, New York.

Philadelphia—Interest in steel bar tonnage lags and until consumers work off stocks now on hand little improvement is expected, perhaps not before August.

Cold Finished

Cold Finished Prices, Page 51

Pittsburgh—Several third quarter contracts for cold-finished steel bars were placed last week by motor car and automobile parts manufacturers. These buyers intimate they will specify lightly until late in July or early in August as inventories will suffice for July needs. The most encouraging factor in the cold-finished market, however, is the fact that since 2.10c, Pittsburgh, is unchanged for this quarter, through June there was little speculative buying. Cold-drawn alloy bars remain based on 3.05c, Pittsburgh.

Plates

Plate Prices, Page 50

Pittsburgh—A large part of an 846-ton plate girder span for July 13 bids to the Pennsylvania state department of highways will be in plates, but other outlets through tanks, river barge and miscellaneous sources is quiet. The plate market is unchanged at 1.85c base, Pittsburgh. An unstated tonnage of plates is required for two ferry boats for Galveston county, Texas, on which barge builders have been asked to bid. Bids will be closed July 16 on the boats, which will range in length from 100 to 140 feet and with a beam width of up to 50 feet. Midland Barge Co., Midland, Pa., is reported to have closed on an order for a single small Ohio river barge last week for a Zanesville, O., buyer.

Cleveland—In plates, apparently there will be less of a cessation of orders than noted in some other finished products, as consumers have not accumulated heavy inventories and buying will be more continuous as new requirements arise. The market now is 2.03½c, delivered in Cleveland.

Chicago—Activity in industrial construction involving plate use is fairly high and increased business of this nature is in prospect for several months. Among recent tank awards are 800 tons for the Carbide & Carbon Chemical Corp. at Whiting, Ind., and 400 tons for the Dow Chemical Co., Midland, Mich. Few construction projects for oil companies are pending. Plate shipments for railroad needs are fairly steady but little increase in such demand is in early prospect.

Boston—Contracting for plate requirements for third quarter is inactive, although a few buyers have covered. Current buying is largely for small miscellaneous lots at 1.95c, Coatesville, Pa.

New York—Plate contracting for third quarter is spotty and sellers are experiencing a distinct letdown. Little railroad equipment business remains and there is not much ship work. Newport News Shipbuilding & Drydock Co. has some tonnage pending, for purchase here, however. Plates are 1.95c, Coatesville, Pa., or 2.13c, New York.

Philadelphia—Ship work features an otherwise dull plate market with over 12,000 tons for 12 ships to be built in private yards for the navy, bids opened August 15. These ships require about 20,000 tons of steel in all. Pusey & Jones, Wilmington, Del., is inquiring for 2000 tons of plates, 685 tons of shapes, 235 tons of junior beams and small channels.

Contracts Placed

800 tons, tanks, Carbide & Carbon Chemical Corp., Whiting, Ind., to Graver Tank & Mfg. Corp., East Chicago, Ind.

400 tons, tanks, Dow Chemical Co., Midland, Mich., to Graver Tank & Mfg. Co., East Chicago, Ind.

125 tons, standpipe, state hospital, Worcester, Mass., to Chicago Bridge & Iron Works, Chicago, $18,850; bids June 15.

Unstated tonnage, structural steel and plates, Panama Canal administration, Washington, to Joseph T. Ryerson & Son Inc., New York, $4016.82; bids June 13, schedule 2967.

Unstated tonnage, water tank, United States department of interior, Concho, Okla., to Pittsburgh-Des Moines Steel Co., Des Moines, Iowa, $4740.

Unstated tonnage, three 55-foot steel-hull diesel work boats, United States engineer, Memphis, Tenn., Dubuque Boat & Boiler Co., Dubuque, Iowa, low.

Contracts Pending

12,000 tons, for twelve naval ships to be built in private yards, entire steel requirements 20,000 tons; bids Aug. 15.

1649 tons, penstock and trash racks, Grand Coulee dam, Almira, Wash.; Silas Mason Co., New York, in combination with Guy F. Atkinson Co., San Francisco, Walsh Construction Co., Davenport, Iowa, and W. E. Kier, San Diego, Calif., low on general contract.

2000 tons, Pusey & Jones, Wilmington, Del.; also 685 tons shapes, 235 tons junior beams and small channels; bids asked.

1000 tons, 54-inch pipe, Sunset pipe line, San Francisco; bids July 6.

175 tons, M street bridge, Sacramento, Calif.; bids opened.

100 tons, boiler, county hospital, Stockton, Calif.; bids opened.

Unstated tonnage, two ferry boats; bids July 16 to Galveston county authorities, Galveston, Texas.

Semifinished

Semifinished Prices, Page 51

Forging billet orders for delivery late this month were being placed last week, this being an encouraging development in the semifinished market. Skelp, wire rod and sheet bar shipments declined noticeably. Semifinished steel shipments through June were probably the best in four years.

Sheets

Sheet Prices, Page 50

New York—New sheet prices have been filed with the American Iron and Steel institute, effective July 7, reducing the amount of the advances announced in April by $1 to $4 a ton. Hot-rolled No. 10, base, Pittsburgh, is quoted 1.85c; Gary, 1.95c. Hot-rolled annealed No. 24, Pittsburgh, is 2.45c; Gary, 2.55c. Cold-rolled No. 10, Pittsburgh, is 2.50c. Cold-rolled No. 20, Pittsburgh, is 2.95c; Gary, 3.05c. Cold-finished mill-run No. 10, Pittsburgh, is 2.40c; cold-finished mill-run No. 20, Pittsburgh, 2.85c. No changes have been filed for galvanized sheets.

Pittsburgh—Practically no incoming sheet specifications were reported last week but shipments were at a high rate not exceeded for any week since early 1930. Consequently, finishing operations held at about 60 per cent of capacity, but most sheet mills will be closed down this week. Producers are adjusting their prices according to the new schedules filed at New York.

Cleveland—Sheet producers anticipate a light volume of business this month, automobile manufacturers having accumulated fairly heavy stocks, and production in other lines, such as household utilities, now past the seasonal peak. Jobbers have large inventories. Mill operations will be engaged for a while in replenishing stock sizes. Relatively small lots on which producers could not give delivery before June 30 were placed during the week for early delivery in July at the advanced prices. These contracts will now be adjusted according to the reductions filed to become effective July 7.

Chicago—A sharp curtailment in sheet mill operations is scheduled for this month following heavy shipments during the past several weeks. While some new business has been received for July delivery, orders are small and consumption of excess inventories accumulated recently is awaited before buying turns upward.

Boston — Contract specifications during the last weeks of the quarter were fairly heavy, notably for galvanized sheets. Sellers expect a gradual revival of buying, but not much before August.

Buffalo — Buffalo district sheet mills plan sharp curtailment in their production which has held at 80 to 90 per cent during the past 60 days.

Philadelphia—Leading sheet sellers estimate that buyers in this district have covered for an average of four to five weeks ahead by releases against second quarter contracts. Little contracting is noted for third quarter. Some early buying by a leading radio manufacturer is indicated.

Cincinnati—A few orders have been booked for early delivery, chiefly for automotive interests. Almost all material on second quarter contracts was specified, and in some cases supplementary orders at the higher prices were received.

Railroads

Track Material Prices, Page 51

Buying of steel by railroads is light and mill backlogs from this source are small. Rail mills in the Pittsburgh district will complete rail and track fastening contracts during July and August and those at Chicago have sufficient tonnage for 40 per cent operation during those two months.

Railroads for their shops and equipment builders for freight car contracts furnish a fairly steady volume of specifications for various steel products but no new orders are being booked at present, except occasional small lots of track accessories and a little steel for car and locomotive repair work.

New York Central will open bids July 5 on hot and cold-rolled steel for its shops and July 12 on an indefinite tonnage of miscellaneous steel for third quarter.

Effective July 1, the advanced price on light rails is $35, Pittsburgh, for billet quality, and $34 for rerolling quality. In turn, this has affected the market on relaying rails, 50 pounds and less, where slight advances have been caused. Heavier sections of relaying rails, 60 to 100 pounds, are quoted unchanged at Pittsburgh.

Rail Orders Pending

Panama Canal office, Washington, 1450 tons rails, bids in; $43.87, delivered, for No. 1 rails, and $41.87, delivered, for No. 2, by all bidders; $11,798 by all bidders on 3400 pairs of angle bars; bids June 27.

Pipe

Pipe Prices, Page 51

Pittsburgh—Stock orders for tubular products are expected to provide from two to three weeks of fair operations for Pittsburgh pipe producers. Although shipments before June 30 were heavy, making the mouth the best in over four years from the standpoint of shipments, a brief survey of buyers of oil country goods indicates that stocks on hand do not exceed 60 days supply and average about 45 days. Some stocking is prevalent in standard pipe where supply houses have been building up inventories rather than pay the $7 a ton advance in pipe becoming effective July 1.

Chicago—Recent advance in cast pipe prices has had little effect on business, with buying generally slow and few new inquiries appearing. Closing on pending work lacks acceleration and what orders are being received generally are for small lots. Shipments are fairly steady.

Boston—Bids are in on 1400 tons of steel pipe for a water project, Boston, the C. & R. Construction Co., Roslindale, Mass., being low. Small lot buying of steel pipe has been fair. Cast pipe inquiry, however, has slumped.

New York—Small lot cast pipe buying is slightly heavier with the placing of more volume. Inquiry is light, but includes close to 500 tons for Wells, N. Y. Much of the recent buying has been through contractors. The recent $2 advance on standard class B cast pipe has not been tested by heavy tonnage inquiries.

Birmingham, Ala.—Cast pipe shops are maintaining steady production though not near capacity. Labor difficulties were threatened at three plants of the district. Melters' inventories of raw material are low.

Cast Pipe Placed

600 tons, West Coxsackie, N. Y., to Donaldson Iron Works, Emaus, Pa.

280 tons, 2 to 14-inch, class 150, Carlin, Nev., to Pacific States Cast Iron Pipe Co., Provo, Utah.

140 tons, 6 and 8-inch, Cortlandt, N. Y., to R. D. Wood & Co., Florence, N. J.

130 tons, Oxford, N. Y., to United States Pipe & Foundry Co., Burlington, N. J.

105 tons, 6-inch, Yorktown, N. Y., to Warren Foundry & Pipe Co., Phillipsburg, N. J.

100 tons, 48-inch, sewer, Lake Placid, N. Y., to Donaldson Iron Works, Emaus, Pa.

Cast Pipe Pending

500 tons, 6 and 8-inch, Wells, N. Y.; bids July 6.

400 tons, 6 and 8-inch, Hampton, S. C.; bids July 3.

128 to 256 tons, 6-inch, class 150, Whittier, Calif.; National Cast Iron Pipe Co., Birmingham, Ala., low.

103 tons, 3 to 24-inch pipe, fittings, Chicago; Rudisil Soil Pipe Co., Anniston, Ala., low.

100 tons, 4, 6 and 8-inch, Auburn, Wash.; American Cast Iron Pipe Co., Birmingham, Ala., low.

Unstated tonnage, 17,113 feet of 12-inch and 5072 feet of 6-inch, Madison, Wis.; James B. Clow & Sons, Chicago, low bidder.

Unstated tonnage, 5100 feet, 3, 4 and 6-

inch. Seattle city light department; bids soon.

Steel Pipe Pending

1400 tons, watermain, Brookline avenue, Boston; C. & R. Construction Co., Roslindale, Mass., low on general contract; bids June 20.

Strip Steel

Strip Prices, Page 51

New York—Reductions of $3 per ton have been filed with the American Iron and Steel institute on hot-rolled strip, effective July 7, bringing the price at Pittsburgh to 1.85c and at Gary to 1.95c. No change has been filed on cold-rolled strip. Substantial releases against last quarter contracts have placed most strip consumers in a position where they will need little additional tonnage over the next few weeks.

Pittsburgh—A few third quarter strip contracts have been negotiated but specifications are not promised until July 15 at the earliest and the average of operations in the strip industry has contracted sharply to 50 per cent of capacity. Little test has been reported on 2.00c, Pittsburgh, base, on hot-rolled strip and 2.80c, Pittsburgh or Cleveland, base, for cold-rolled strip.

Cleveland — A few automobile manufacturers, notably Chrysler, have accumulated large stocks which will be ample for July requirements, but others probably will have to start buying again the latter part of this month. Producers shipped all the material for which they had specifications in completing second quarter contracts last week. Actual rolling operations were down sharply 30 hours or more before the end of the week, to allow time for processing.

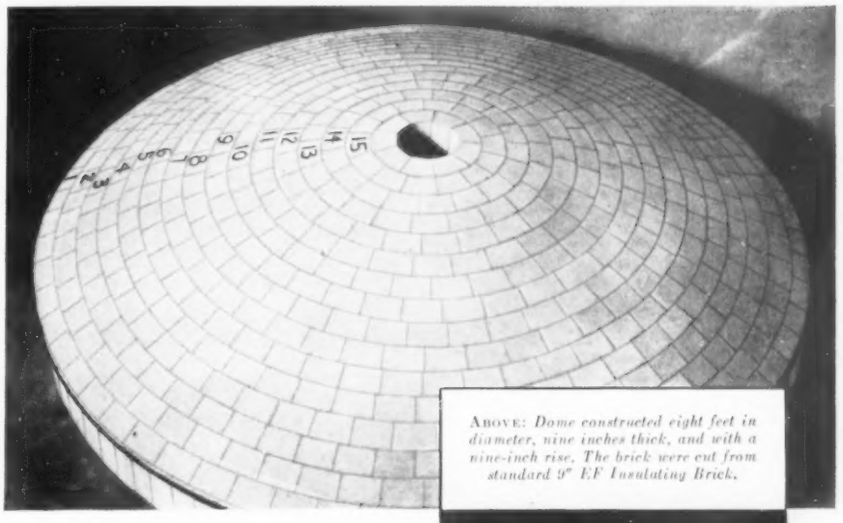
Chicago—A few small strip orders have been booked for third quarter delivery but heavy shipments the past month will accommodate most users' requirements for a portion of the new period, and some producers plan a complete shutdown the latter part of this month. Hot-rolled strip continues 2.10c, Chicago, with cold-rolled strip 2.80c.

Boston—Cold-rolled strip production is off sharply with the completion of second quarter specifications. In some instances rerollers are fairly well stocked with hot-rolled material. Consumers are showing slight interest in third quarter needs at 3.00c, Worcester, for cold-rolled.

Philadelphia—Selling of steel strip is at a standstill and most consumers are well covered for current needs.

For this

8-FOOT DOME



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Shapes

Structural Shape Prices, Page 50

Pittsburgh—Structural shape inquiry is improving, led by an 8000-ton pier shed at New York. United Engineering & Foundry Co., Pittsburgh, has completed plans for the Ford Motor Co.'s strip mill and inquiry has been issued calling for 1400 tons of structural shapes, a considerable reduction from the original intention to buy a building requiring 5000 tons. Plain structural shapes remain 1.85c, Pittsburgh, and steel sheet piling, 2.15c base, Pittsburgh.

Included in a $25,000,000 PWA loan granted to Allegheny county, Pennsylvania, are provisions for six large bridges in the vicinity of Pittsburgh requiring an estimated 30,000 tons of shapes. The government released appropriations June 27 for 340 postoffices throughout the country, requiring an unstated tonnage of shapes and concrete bars, but estimated to total 15,000 tons.

Cleveland—As there was little speculative buying in structural shapes, the market shows relatively less reaction after the June bulge than various other finished steel products. Several awards were made during the week, and good size tonnages of shapes and sheet piling on which bids recently were taken are up for early action. The federal government has appropriated $2,500,000 for postoffices in six Ohio cities which will require a substantial tonnage of shapes. Westinghouse Electric & Mfg. Co. is contemplating $200,000 expenditure for building and remodeling at its Mansfield, O., plant.

Chicago—Illinois has closed on 2600 tons for four viaducts and subways while 2100 tons for two state bridges in Cook county are pending, low bidder on the latter having been announced. Largest of new inquiries is 5200 tons for the superstructure of the Mississippi river bridge between Bettendorf, Iowa, and Moline, Ill.

Boston—While the potential volume of structural steel includes several large bridge jobs, active business is light. Several bridge repair projects at Bostpn are under way, taking a fair tonnage.

New York—Structural steel outlook has brightened materially with two additional sections, including bridges, for the new York Central west-side Manhattan improvement, taking an estimated 25,000 tons, soon to come out. Bids are expected on this project in about one month while figures go in July 5 on pier sheds for the New York city department of docks, taking slightly more than 8000 tons.

Small shapes have been reduced to 1.80c, Pittsburgh, effective July 7, but no filing has been made on heavy structurals.

Philadelphia—Except for approximately 1000 tons for a Reading, Pa., high school, on which bids will be opened July 6, structural work pending is light. Meanwhile, fabricators are operating at a fair rate on small, scattered tonnages.

Shape Contracts Placed

3800 tons, bridge, South Omaha, Nebr., to American Bridge Co., Pittsburgh.

1130 tons, building, Distillers Co. Ltd., Linden, N. J., awarded direct by owner; Turner Construction Co., New York, general contractor.

1000 tons, viaduct, route 3, Madison county, Illinois, to Midland Structural Steel Co., Chicago.

900 tons, two subways, Niles Center, Ill., to American Bridge Co., Pittsburgh.

900 tons, building for General Aniline Works Inc., Grasselli, N. J., to Belmont Iron Works, Philadelphia.

880 tons, for completing fabrication of structural material, Boulevard Gardens apartments, Queens, N. Y., to National Bridge Co., Long Island City, N. Y.

765 tons, Michigan state highway bridge, Mackinaw, Mich., to Lackawanna Steel Construction Corp., Buffalo.

700 tons, viaduct, route 8, Peoria, Ill., to Mississippi Valley Structural Steel Co., Decatur, Ill.

700 tons, bridge, Winneconne, Wis., to Worden-Allen Co., Milwaukee.

700 tons, bridge, Newport, Ark., to St. Louis Structural Steel Co., St. Louis.

680 tons, bridge, Melrose Park, Ill., to McClintic-Marshall Corp., Bethlehem, Pa.

550 tons, bridge, Eldorado, Ark., to Arkansas Foundry Co., Little Rock, Ark.

465 tons, truss spans, Webster county, Iowa, to Pittsburgh-Des Moines Steel Co., Des Moines.

445 tons, coal washer building for Koppers Co., Pittsburgh, to Ohio Structural Steel Co., Newton Falls, O.

400 tons, addition, Atlas Brewing Co., Chicago, to Cerny Pickas & Co., Chicago.

318 tons, state bridge and two crossings, Elbert and Lincoln counties, Colorado, to unnamed interests.

300 tons, Fort Pitt Brewing Co., plant, Sharpsburg, Pa., to Fort Pitt Bridge Works, Pittsburgh.

300 tons, store building for P. Deisroth's Sons, Haselton, Pa., to Weatherly Steel Co., Weatherly, Pa.; through R. H. Woelfer, Haselton.

290 tons, Trinity river bridge, Anderson-Freestone counties, Texas, to Austin Bros., Dallas, Tex.; L. H. Lacy, Dallas, general contractor.

265 tons, Chicago sanitary district sewage plant, to Continental Bridge Co., Chicago.

250 tons, bridge, Butler county, Missouri, to Stupp Bros. Bridge & Iron Co., St. Louis.

220 tons, state highway bridge, Van Bibber, Md., to McClintic-Marshall Corp., Bethlehem, Pa.

220 tons, addition, Masonic Temple, Columbus, O., to C. E. Morris Co., Columbus, O.

200 tons, bridges, state highway 25, Lawrence-Green counties, Arkansas, to Vincennes Bridge Co., Vincennes, Ind.

190 tons, bridge, Penobscot river, Medway, Maine, to Lackawanna Steel Construction Corp., Buffalo.

180 tons, bridge, Eagle county, Colorado, for United States bureau of public roads, to unnamed interest.

170 tons, state highway bridge, Lexington, Ky., to McClintic-Marshall Corp., Bethlehem, Pa.

162 tons, 1500-foot 3-track, deck, plate girder, overhead bridge, Middletown township, Bucks county, Pennsylvania, to McClintic-Marshall Corp., Bethlehem, Pa.; through Bates & Rodgers Construction Co., Girard, Pa.

153 tons, state highway bridges, Choctaw county, Alabama, to Nashville Bridge Co., Nashville, Tenn.; W. F. Scott, Thomasville, Ga., general contractor.

150 tons, bridge, Bellamy river, Dover, N. H., to American Bridge Co., Pittsburgh; through Warren Bros. Roads Co., Cambridge, Mass.

145 tons, hospital addition, Bronx, N. Y., to Ingalls Iron Works Co., Verona, Pa.; E. Waters & Co., general contractor.

130 tons, bridge, Grand Trunk railroad, Lansing, Mich., to American Bridge Co., Pittsburgh.

125 tons, building for Firestone Tire & Rubber Co., Bridgeport, Conn., to Bethlehem Fabricators Inc., Bethlehem, Pa.; through Topper & Griggs.

100 tons, state bridges in Campbell and Albany counties Wyoming, to unnamed interest.

100 tons, state crossing, Salt Lake and Tools counties, Utah, to unnamed interest.

100 tons, church, Malden, Mass., to Groisser-Schlager Iron Works, Boston.

Shape Awards Compared

	Tons
Week ended June 30	**17,385**
Week ended June 23	**23,757**
Week ended June 16	**16,311**
This week in 1933	**13,290**
Weekly average for 1933	**15,413**
Weekly average, 1934	**17,174**
Weekly average, May	**19,866**
Total to date, 1933	**402,870**
Total to date, 1934	**463,717**

Shape Contracts Pending

25,000 tons, two sections, including bridges, New York Central railroad, west side, Manhattan, N. Y.; bids in about one month.

8250 tons, pier sheds, docks 88, 90 and 92, Hudson river, New York; bids July 5 to department of docks, Manhattan, N. Y.

5200 tons, superstructure, Mississippi river toll bridge, Bettendorf, Iowa, to Moline, Ill.; bids to bridge commission, Davenport, Iowa, July 9.

2500 tons, estimated, original plans revised, Bayside high school, Queens, N. Y.; Royal-Rice Co., New York, low.

2213 tons, M street bridge, Sacramento, Calif.; bids opened.

2100 tons, two bridges, Sag district, Cook county, Illinois; McClintic-Marshall Corp., Bethlehem, Pa., low.

2050 tons, Parker dam on Colorado river for California-Arizona bureau of reclamation, Los Angeles; bids opened.

1940 tons, state highway bridges, Texas.

1900 tons, power house, substation, Bonneville dam, Oregon; bids to federal engineers, Portland, Oreg., July 6.
1580 tons, Deception Pass spans, Washington; Puget Construction Co., Seattle, low.
1400 tons, hot strip mill building for Ford Motor Co., River Rouge, Mich.; bids being taken.
829 tons, 1816-foot 2-span steel truss and through plate girder bridge, Blairsville borough, Derry township, Indiana-Westmoreland counties, Pennsylvania; bids to state department of highways, Harrisburg, Pa., July 13.
750 tons, auditorium, San Jose, Calif.; bids opened.
700 tons, seven hangars, bureau of yards and docks, naval operating base, San Diego, Calif.; bids July 11.
600 tons, court and custom house, Mobile, Ala.; T. L. James & Co. Inc., and R. D. Landis, Ruston, La., low on joint bid.
480 tons, state infirmary building, Orangebury, N. Y.
450 tons, sanitarium-hotel, Saratoga Springs, N. Y.; specifications out.
275 tons, state highway bridge, Arkansas.
275 tons, state highway bridge, Michigan.
200 tons, sheet piling, coast guard bulkhead, Ashtabula, O.; bids in July 29.
200 tons, building, Wilmerding, Pa., for Westinghouse Air Brake Co.
175 tons, highway bridge over Intracoastal waterway, highway 117, Conway-Myrtle, S. C., for United States engineer, Charleston, S. C.; Tidewater Construction Corp., Norfolk, Va., low.
165 tons, bridge, Madisonville, St. Tammany parish, Louisiana; bids July 17.
134 tons, state bridge to carry tracks of Pennsylvania, Reading and Seashore railroads, over route 48, section 27, Pleasantville, Atlantic county, New Jersey; bids July 18.
125 tons, girls' dormitory, Western Maryland college, Westminster, Md.

Wire

Wire Prices, Page 51

Pittsburgh — All second-quarter wire obligations were completely shipped by producers before the end of last week. The market is now uniformly quoted at $2.60 per keg on nails, 2.30c for plain wire and 2.45c on annealed fence wire. Jobbers generally stocked up heavily on merchant items before the quarter ended.

Cleveland—Little interest in third quarter has been displayed so far by consumers, their stocks for July being fairly heavy. Cancellations of second quarter tonnage at the close of June were moderate.

Chicago—Activity in the wire market is declining with the expiration of low price contracts and completion of shipments against such orders. New business is light and consumption of manufactorers' wire is lighter in a number of industries. Few contracts have been placed for third quarter. The price is $2.65 for wire nails and 2.35c for plain wire.

Boston—New England wire mills were able to ship practically all the volume specified last quarter, although some late releases did not leave mills until June 30. Plain wire now is 2.40c, Worcester, Mass., on all business.

Ferroalloys

Ferroalloy Prices, Page 52

Ferromanganese specifications reflect the decline in steelmaking operations. New contracts are well lined up, but releases are expected to be light over the next few weeks. The market is $85, duty paid, Atlantic and Gulf ports. Spiegeleisen, 19 to 21 per cent, is moving slowly, with $26, furnace, applying on lots up to 50 tons, and $24 on lots of 50 tons or over.

Iron & Steel Products Inc., Chicago, dealer in iron and steel products and scrap, has discontinued its St. Louis district office.

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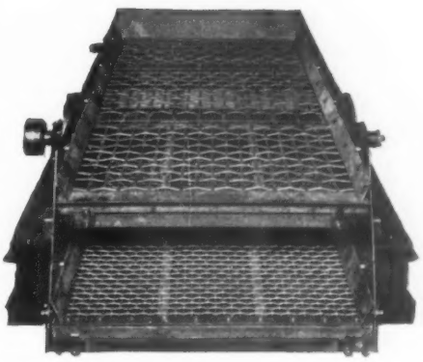

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Reinforcing

Reinforcing Bar Prices, Page 51

Pittsburgh—Heavy inquiry for reinforcing bars continues but is confined mainly to the Pacific coast district. Bids are to be asked July 6 by the Portland, Oreg., engineers for 10,000 tons of reinforcing bars in contract No. 13 for the Bonneville, Oreg., power house. A large part of 7,000,000 pounds of various steel products will be reinforcing bars for dams at Parker, Ariz., and Earp, Calif., as well as a 4,000,000-pound inquiry for Casper and Alcora, Wyo., dams. The reinforcing bar market holds at 2.05c, Pittsburgh, on cut lengths, and 1.90c, Pittsburgh, on rail steel bars.

Cleveland—Small lots for state road and bridge work are pending for action early this month, but otherwise the market is dull. Few private projects are developing needs for concrete bars.

Chicago—While a fair volume of reinforcing bars is pending for various projects, few awards have been made recently. Low bidders have been announced on Chicago sanitary district work involving 800 tons of bars. Buying for Illinois road building is less active while shipments are steady. The government's recently announced program for postoffice construction is expected to involve moderate bar tonnages in this district.

Boston—Sanitation projects, placed and pending, account for slightly more than 500 tons. Although several of the larger tonnages pending have been recently awarded, a fair volume is still up, including several hospital projects, highway and bridge work.

New York—Reinforcing bar lettings are light, largely for highway and bridge work. Additional requirements are out for New Jersey highways. Truck delivery to the job has been increased $2 a ton on all reinforcing bars.

Philadelphia—The market is quiet, with awards for the week in this district restricted to small scattered lots.

Reinforcing Steel Awards

1000 tons, for 4300 units of hollow spun concrete tapered piling for use in Twin Locks No. 26 at Alton, Ill., by Westinghouse Electric & Mfg. Co., 500 tons each to Laclede Steel Co. and Missouri Rolling Mills Corp., St. Louis.

275 tons, Stonnybrook sewer section, Boston, to Northern Steel Co., Boston; 225 tons pending for section 1, same project.

200 tons, science building, Wellesley college, Wellesley, Mass., to Joseph T. Ryerson & Son Inc., Cambridge, Mass.

191 tons, Verdugo wash conduit, Los Angeles county, California, to unnamed interest.

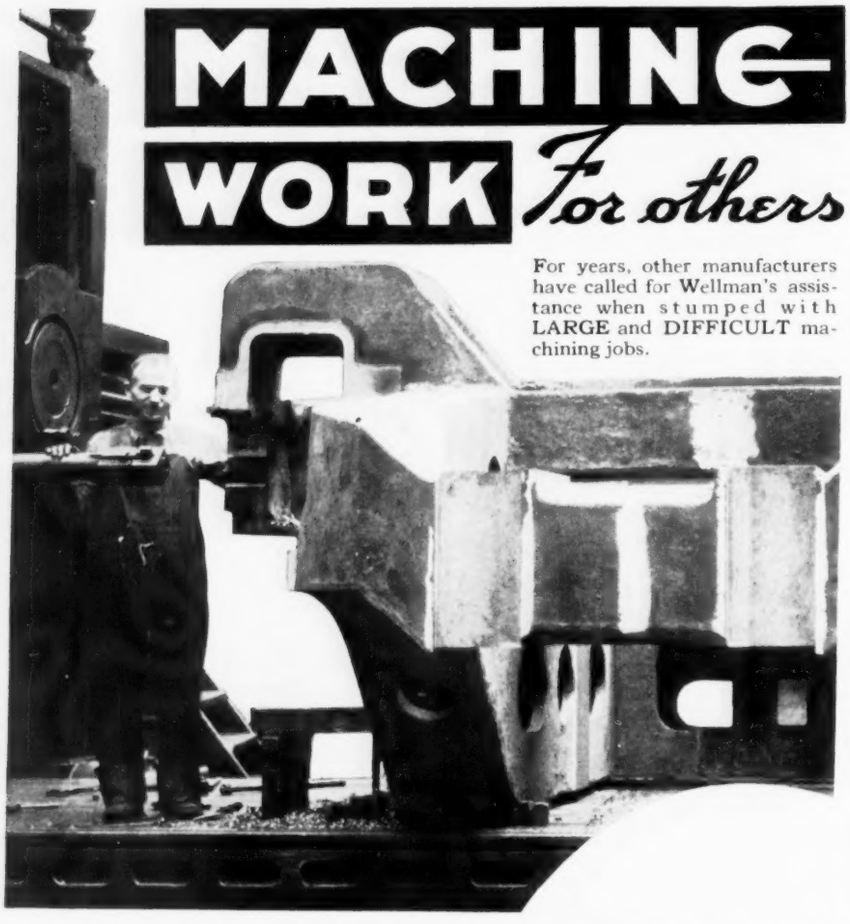
159 tons, bars and bar joists, dormitories and utilities building, Virginia Polytechnic institute, Blacksburg, Va.;

100 tons, C. F. Johnson grade school, Johnson City, N. Y., to Truscon Steel Co., Youngstown, O.; B. Klein, Binghamton, N. Y., general contractor.

100 tons, Trinity river bridge, Ander-

Concrete Awards Compared

	Tons
Week ended June 30	2,025
Week ended June 23	2,485
Week ended June 16	5,078
This week in 1933	5,945
Weekly average for 1933	3,771
Weekly average, 1934	4,778
Weekly average, May	4,633
Total to date, 1933	83,350
Total to date, 1934	129,031



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son-Freestone counties, Texas, to Southern States Steel Corp., Dallas, Tex.; L. H. Lacy, Dallas, general contractor.

159 tons, bars and bar joists, dormitories and utilities building, Virginia Polytechnic institute, Blacksburg, Va.; 83 tons of bars to Virginia Steel Co., Richmond; 66 tons of bar joists to Laclede Steel Co., St. Louis; J. F. Barbour & Sons,, Roanoke, Va., general contractors.

Reinforcing Steel Pending

10,000 tons, new billet steel bars, power house, Bonneville, Oreg., dam, contract No. 13; bids to Portland, Oreg., federal engineers, July 6.

3500 tons, various classifications of metal work including mainly reinforcing steel bars, government dams at Parker, Ariz., and Earp, Colo.

2000 tons, various classifications of metal work including mainly reinforcing steel bars, government dam at Casper, Wyo., and Alcora, Wyo.

807 tons, section 9, Chicago sanitary district; Paschen Bros. Inc., Chicago, low.

625 tons, noncorrosive reinforcing fabric for United States engineer, Memphis, Tenn.; bids June 29.

171 tons, San Gabriel river bridge, Los Angeles county, California, for state; bids July 12.

162 tons, Deception Pass spans, Washington; Puget Construction Co., Seattle, low.

118 tons, 2-span, steel truss and through plate girder bridge with approaches, Blairsville borough, Derry township, Indiana-Westmoreland counties, Pennsylvania; bids to state department of highways, Harrisburg, Pa., July 13.

115 tons, dining hall and kitchen, state hospital, Tewksbury, Mass.; bids in.

110 tons, including 67 tons of fabricated structural steel and 43 tons of plain steel bars, state bridge, Chambersburg borough, Franklin county, Pennsylvania; Grahams Construction Co., Lancaster, Pa., low for general contract.

Warehouse

Warehouse Prices, Page 54

Cleveland—While the number of orders received by some leading warehouses here in June was less than in May, total tonnage for the month showed little change. Numerous small strikes tend to impede business.

Chicago—June sales for some interests show a slight increase over May, with demand heavier than a year ago. Prices are unchanged.

Boston—Steel warehouse volume has dropped, the decline covering most products. As a rule industrial consumers of steel out of warehouse have small stocks. Prices are firm and unchanged.

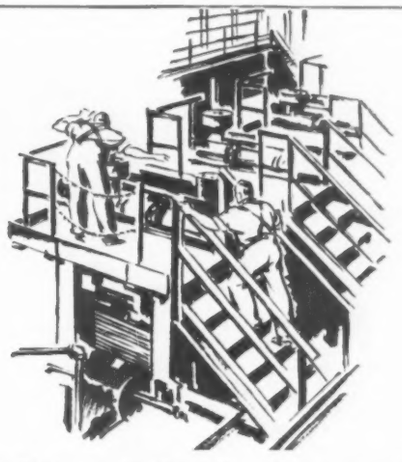
New York—Warehouse volume continues to lag, largely due to some consumers, who usually buy from jobbers, placing moderate requirements direct with mills.

Philadelphia—Leading jobbers report a decline in June tonnage of about 15 per cent, due to sharp decline in specifications in the last half of the month. Prices are unchanged.

Detroit—No pronounced decline was evident last week in shipments by steel warehouses. Prices are steady and unchanged.

Cincinnati—Volume from warehouse during June was close to the April and May level. This may have been aided by quiet building of inventory against steel strike threats, but a reaction because of the settlement of labor difficulties has not been noted.

St. Louis—Warehouse prices on sheets were advanced 40 cents per 100 pounds, effective July 1, as St. Louis warehouses did not follow the general advance some time ago.



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Pig Iron

Pig Iron Prices, Page 52

Pittsburgh—Outlook for July is not promising and no sizable inquiry appears in sight. The market remains quoted $18.50 for foundry grades, $18 on basic and $19 for bessemer, all Neville Island base. One of Carnegie Steel Co.'s Edgar Thomson works blast furnaces continues on bessemer pig iron entirely for A. M. Byers Co.

Boston—With shipments completed on second quarter contracts, demand is light, with little interest being shown for this quarter. Foundry melt is still low, although one textile equipment builder has bookings to carry into September.

Cleveland—June pig iron shipments in the lakes district exceeded by a slight margin the combined totals for April and May. Melters specified practically all of their second quarter tonnage, even though the price advance for third quarter is only $1 a ton, the market now being $18.50, base, Cleveland, Toledo, Erie, Pa., and Detroit, for No. 2 foundry iron.

Chicago—Light shipments are in prospect for July, although some business for delivery this month has been booked. Deliveries during June recorded an increase of about 65 per cent over May. Sellers received a fair number of spot orders late last month which helped to bolster shipments and although foundry schedules are fairly well maintained stocks are sufficient for several weeks.

New York—With tonnage received under second quarter contracts, pig iron consumers generally appear to have enough material on hand to last them into August. Meanwhile, there appears to be little disposition among consumers to contract for third quarter.

Philadelphia—June shipments were the heaviest for any month this year, and comparative quiet is looked for in the pig iron market for the next few weeks. One local seller reports only two cancellations of unspecified second quarter tonnage. An eastern Pennsylvania merchant producer contemplates suspending operations early this month.

Buffalo—June shipments of iron from Buffalo furnaces were the best of the year. Furnaces reduced their stocks considerably during the month.

Youngstown, O.—Three blast furnaces in this district were taken off last week. Republic Steel Corp. stack at Warren, O., is down for repairs; and this company's No. 3 stack at the Haselton group also was blown out. Youngstown Sheet & Tube Co. dropped its A stack at the Campbell works. Nine of 31 stacks continue in blast, with a possibility of further reductions this month.

Cincinnati—Little pig iron tonnage is on the books of furnace representatives in this district and dullness over the next few weeks is generally anticipated.

St. Louis—Shipments this month will be relatively small, with melters well supplied with iron bought for second quarter delivery. Melt in the stove industry is still fairly heavy.

Birmingham, Ala.—Melters are buying in small tonnages with apprehension being expressed over labor difficulties.

Toronto, Ont.—Minor improvement developed in the pig iron market during the week, due to the fact that several melters were out of supplies. Production is in excess of 1000 tons per day.

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Scrap

Scrap Prices, Page 53

Pittsburgh—Because of no new mill buying of scrap last week and because operating schedules are lower, the market is nominal. Mill inventories of scrap are at the lowest point in many years and some activity in scrap is inevitable as soon as steel mill operations increase. Meantime No. 1 heavy melting steel at $11.75 to $12.25 is nominally firm.

Cleveland—Closing for Independence day and irregular resumption for the remainder of the week has added to the dullness of steel and iron scrap and shipments have been suspended by many melters. Heavy breakable scrap is down 75 cents and malleable scrap 50 cents. Other prices are nominal.

Chicago—Scrap is dull, with mills generally out of the market and receiving only small lots against orders. Absence of buying makes most prices nominal and lends weakness although offerings are only moderate and there is little disposition on the part of sellers to force sales. Heavy melting steel continues $9.50 to $10. Several fairly large railroad lists are pending.

Boston—Scrap prices are beginning to recover from the recent steady declines with 25 cents a ton advance on heavy melting steel, scrap rails and shafting, and 50 cents on machine shop turnings.

New York—Shipments of heavy melting steel to Coatesville, Conshohocken and Pencoyd, Pa., from Northern New Jersey, following recent new buying are fairly heavy with prices for rail shipment unchanged. New inquiry, however, has eased somewhat. Buying for barge loading has slackened. Prices are steadier, but are slow to turn upward.

Philadelphia—Although prices of most grades of steel and iron scrap are unchanged the market is weak, reflecting the dull outlook. Dealers continue to buy No. 1 steel against contracts for delivery at Claymont, Del., on the basis of $10.50, delivered. On the other hand, Bethlehem Steel Co. recently bought 1000 tons of No. 1 steel for delivery at Steelton, Pa., as low as $9.50, with only a portion picked up locally. Export demand is dull although two ships are loading here with No. 1 and No. 2 steel for Japan, against old orders. Counter to the general trend, forge fire scrap is higher at $9.50 to $10.

Buffalo—Scrap is inactive and prices are nominal. Dealers have some tonnage to ship on orders but are closing no new contracts. Buyers are reported to have ideas below the nominal markets now prevailing but are not anxious to make purchases at any price.

Detroit—For the fourth consecutive week the scrap market is steady on the basis of $8 to $8.50 on No. 1 heavy melting steel.

Cincinnati—A stronger iron and steel scrap market in some districts has influenced sentiment here, but there is no change in the disposition of important melters not to buy now. Tonnage sales are lacking, only miscellaneous lots and some material on unfilled contracts moving. Prices are unchanged and nominal.

St. Louis—The steel and iron market continues to mark time. Mills are not buying. Prices are unchanged and nominal following adjustment of some items the preceding week.

Birmingham, Ala.—Sluggishness is noted in all classes of scrap and

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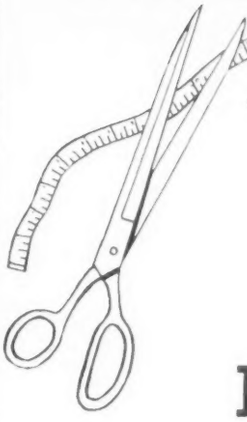

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(Pittsburgh District)
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little tonnage is moving. Heavy melting steel quotations are weak and $9 would be acceptable.

Toronto, Ont.—Larger shipments of iron and steel scrap have been going forward recently. One or two local dealers report improved demand while others state that business is at a standstill. Sales, however, are for spot delivery and mostly in iron grades.

Metallurgical Coke

Coke Prices, Page 51

The beehive coke market is in its dullest period of the year and although prices are quoted unchanged, there has been little test. On a Connellsville oven basis, furnace coke is quoted $3.85 and foundry coke $4.60, both for prompt shipment. The usual deduction of 25 cents a ton continues for furnace coke contracts.

By-product foundry coke shipments at Chicago in June were 15 per cent below those of May, and July is expected to show a greater shrinkage. Prices are unchanged. Cincinnati suppliers find shipments decreasing, though the June loss was less than expected. Birmingham cokemakers find demand is not sufficient to absorb their entire production.

Nonferrous Metals

Nonferrous Metal Prices, Page 52, 53

New York—A mixed situation was apparent in nonferrous metal prices last week with demand generally light.

Copper—Blue eagle copper sales were light, amounting to only a few hundred tons daily. Tone of the market remained steady, however, since sellers are well booked ahead. The foreign market for the red metal was easier and this had a depressing effect on scrap since custom smelter intake figures are based on 50 per cent of the blue eagle price and 50 per cent of the export level. About 85 per cent of the copper consuming industry now has signed up to use blue eagle copper. Copper and brass rolling mills are beginning to feel the summer recession but are looking for a busy fall season.

Lead—American Smelting & Refining Co. reduced its price on pig lead $3 a ton Thursday and $2 a ton more Friday. Independent sellers quickly followed the reductions. The New York figure was 3.75c and the East St. Louis price 3.60c. The cuts followed slow buying and a further increase of 10,000 tons in surplus stocks in May.

Zinc—The market firmed up on reports that the Tri-State ore industry would curtail production drastically during July. Prime western metal sold early in the week at 4.20c, East St. Louis, but later advanced 4.30c to $4.35. Buying was light.

Tin—Prices moved slightly higher with the average on spot Straits above the 51-cent level. Consumers buying was a little more active on some days but the bulk of the activity was in professional covering.

Antimony—Buying was slow. Prices tended downward.

Aluminum—Easiness was apparent on No. 12 remelt but most sellers held standard grade at 15.00c.

Silver—Commercial bars shot up to 46.25c Friday.

Tin Plate

Tin Plate Prices, Page 50

Pittsburgh—Owing to scheduled shutdowns in several tin plate producers' plants for this week, the average of tin plate operations will fall 20 points to 50 per cent of capacity. Those producers which will not close down all week will be affected by the midweek holiday. Prices on tin mill products are unchanged at $5.25, per base box, on tin plate, and 2.85c, Pittsburgh, on tin mill sizes of black sheets.

New York—Tin plate is one of the few major products for which demand is expected to be sustained over the next few weeks. With the canning season at full tide, releases last month were heavy, and while new orders have tapered off they are expected to continue in fair volume.

Bolts, Nuts, Rivets

Bolt, Nut, Rivet Prices, Page 51

Bolt and nut contracting at reaffirmed prices is getting under way slowly. Aside from some railroad specifications, spot demand is negligible. Operations at eastern bolt and nut plants are said to be around 30 per cent. Consumers are placing contracts at Cleveland for that period, but in less volume than for second quarter. At Pittsburgh a satisfactory volume of contracts is being placed but specifications are smaller. Railroads needs are well maintained at Chicago. Jobbers are buying little.

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firmed prices for third quarter at 3.00c, base, Cleveland and Pittsburgh; 3.10c, Chicago; and 3.15c, Birmingham.

Coke By-Products

Coke By-Product Prices, Page 51

New York—Production of distillates is expected to decline during the third quarter. Prices are unchanged. Sellers of sulphate of ammonia took no orders for shipment at $25 a ton, eastern seaboard, beyond June 30 and a price announcement is expected early this week. Phenol trade is steady and a fair spot demand continues for naphthalene.

Quicksilver

New York—Quicksilver prices are unchanged in a quiet market. Small lots are $75.50, a virgin flask of 76 pounds in small lots, and down to $74.50 a flask in round lots.

Production

(*Continued from Page* 12)

Aliquippa and the other at Eliza works, while Bethlehem Steel Co. blew out two of its Johnson, Pa., furnaces, and National Tube Co. banked both of its McKeesport, Pa., stacks.

Carnegie Steel Co. will soon bank some of the 10 of its 32 blast furnaces it had on late last week as will Jones & Laughlin Steel Corp., now operating 4 of 11, and Bethlehem Steel Co., 3 of 7.

It is possible that blast furnaces will be either banked or blown out by American Steel & Wire Co., Pittsburgh Crucible Steel Co., and Pittsburgh Steel Co., each operating 1 of 2 furnaces up until late last week.

Wheeling—Off 19 points last week to 62 per cent, with 23 out of 39 open-hearth furnaces active. A total of eight open hearths was dropped from the active list by producers with plants at Portsmouth, O., Weirton, W. Va., Steubenville, O., and Toronto, O., during the week. The rate may go to 50 this week.

Detroit—Rose 11 points last week to 93 per cent, due to one producer starting up two more open-hearth furnaces, making a total of 16 of 17 open-hearth furnaces active.

Central eastern seaboard—Decreased 10 points to 36 per cent last week, with a further similar decline indicated for this week and a fair rebound in the week following. Replenishing of stocks is expected to

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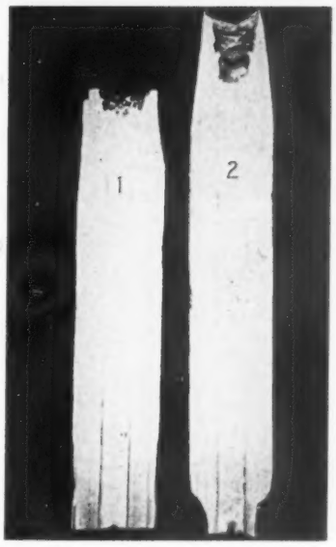

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contribute substantially to production during first part of July.

New England—Down 5 points last week to 65 per cent, despite the fact one steelworks increased output to 100 per cent during that period. For the week starting July 2 a further drop of at least 10 points is likely.

Youngstown—By the end of the week only 30 out of 83 open-hearth furnaces were active, leaving the rate for the district at 52 per cent, a reduction of 10 points. Further curtailment will occur this week due to the July 4 holiday, but the shrinkage will not be so great as last week. Republic has blown out one stack each at Haselton and Warren, and Youngstown Sheet & Tube is blowing out its A stack.

Cleveland-Lorain—Declined 12 points to an average of 64 per cent last week, Corrigan, McKinney Steel Co. operating 12 open hearths; Otis Steel Co. 3; and National Tube Co., Lorain, 10. For the current week, the average is likely to be reduced to around 25 per cent, with few open hearths on until July 5. Corrigan, McKinney company is to resume then with six units, Otis with three, and National Tube with eight.

Birmingham—Steel production was at 55 per cent last week, but this rate is expected to drop to 23 per cent as rail rolling schedules near end. Open-hearth furnaces at Fairfield and Gadsden continue active.

Buffalo—Declined all week, starting at 48 per cent and closing at 24, averaging about 36 per cent last week. This week only 9 of 38 open hearths are scheduled for operation, and further curtailment is anticipated over the July Fourth holiday.

Chicago—Dropped 12 points to 51 per cent by the end of last week, with a further decrease in prospect for the coming week. Illinois Steel Co. has shut down two blast furnaces, leaving the district 12 active stacks out of 36. Production of semifinished steel for stock by some interests will retard the decline in operations for a short period this month.

They Say:

ONE of the serious aspects of our present situation concerning national industrial recovery is a disposition on the part of our legislators to attempt to legislate for every disease that presents itself regardless of whether the disease is contagious or whether it is prevalent enough to assume epidemic proportions. The Wagner bill in my opinion seeks to legislate for all industry in a manner which will correct the trouble which may exist in one-half of 1 per cent of the industries in the United States. No legislation can possibly replace in any degree whatsoever the cordial industrial relations between employers and employes in most of our industrial plants today."—Philip M. Morgan, treasurer, Morgan Construction Co., Worcester, Mass.

NRA

PUBLIC hearing on the proposed uniform cost and estimating system for the gray iron foundry industry has been called by Deputy Administrator Cowling for July 6. Budget of the gray iron foundry industry, based upon a contribution of 50 cents for each $1000 of gross sales per quarter has been approved.

Other NRA developments the past week include:

Budget of manganese industry code authority, based upon voluntary subscriptions of $100 per member, has been approved.

A special 90-day investigation has been ordered of so-called monopoly prices in aluminum in conjunction with provisional approval of the aluminum code, which has been attacked by independent producers.

An amendment to the construction machinery code permits companies of the trade who warehouse, sell or distribute used machinery to elect a member of the code authority.

Proposed amendments to the code of the steel plate fabricating industry, considered at a hearing June 25, developed strong opposition. These amendments extended the code to the entire United States, limiting the maximum work-week to a flat 8-hour day and 5-day week, granted permission for overtime in emergencies at time and one-half for shop work, and double time for repair, renewal and construction or erection work, increased the minimum wage from 30 to 35 cents per hour in the South, and prohibited employment of apprentices.

NRA Administrator Johnson has approved the following personnel of the code authority for MAPI:

W. S. Shipley, president, York Ice Machinery Corp., York, Pa.; W. C. Dickerman, president, American Locomotive Co., New York; Leo W. Grothaus, assistant to the president, Allis-Chalmers Mfg. Co., Milwaukee; Paul C. De Wolf, vice president, Brown & Sharpe Mfg. Co., Providence, R. I.; P. C. Brooks, executive vice president, Fairbanks, Morse & Co., Chicago; George P. Torrence, president, Link-Belt Co., Chicago; N. W. Pickering, president, Farrel-Birmingham Co., Ansonia, Conn.; Robert E. Friend, president, Bordberg Mfg. Co., Milwaukee; George H. Houston, president, Baldwin Locomotive Works, Philadelphia; A. M. Mattison, president, Mattison Machine Works, Rockford, Ill.; Guy A. Wainwright, president, Diamond Chain Mfg. Co., Indianapolis; and Denis F. O'Brien, president, A. P. Smith Mfg. Co., East Orange, N. J.

Fiction and Fact About World Supply of Iron Ore

IN 64 years the world will no longer have sufficient iron ore to meet its needs!"

This startling statement is accredited in wireless dispatches to American newspapers to a Dr. Frowein, of Ludwigshafen, Germany, in speaking to the annual convention of German chemists in Cologne recently.

The herr doctor is reported to have been several years investigating the world's reserves, and the rate of growth in the use of iron, which he says is 3½ per cent annually.

EDITOR'S NOTE:

A world congress of mining engineers and geologists in 1926 *estimated the world's "actual" reserves of iron ore—usable as mined—as* 58 *billions of tons, sufficient for* 276 *years at the* 1929 *world rate of production. It estimated the world's "potential" reserves—low grade ore with a possibility for use after beneficiation—as* 167.6 *billions of tons.*

Included in this estimate were 10.4 *billions of tons "actual" and* 83.8 *billions of tons "potential" for the United States. These "actual" reserves in the United States would be sufficient for* 142 *years at the* 1929 *rate of production.*

The mines experiment station, University of Minnesota, in STEEL, *May* 8, 1933, *reported after long investigation that in the Lake Superior district alone there still remains* 1.1 *billions of tons of high-grade shipping ore; plus partially oxidized material from which* 1.3 *billions of tons of high-grade concentrate can easily be made; plus sufficient unaltered formation from which* 57.2 *billions of tons of high-grade concentrate can be produced, a total of* 59.6 *billions of tons—sufficient to support shipments from the Lake Superior district at the* 1929 *rate for* 900 *years.*

Pacific Coast

Pacific Coast Prices, Page 54, 52, 54

San Francisco—*(By Air Mail)*—Continuance of the longshoremen's strike is causing a shortage of steel products from eastern mills, which is having an adverse effect on production by many metalworking plants, as well as on construction.

Bids have been opened on 600 tons of concrete bars for an auditorium at San Jose, Calif., and San Francisco will open bids July 6 for the Sunset pipe line requiring 1000 tons of 54-inch pipe, using 5/16 or ⅜-inch plates. Bids have been opened on the Parker dam, Colorado river, Nevada, calling for 500 tons of plates, 937 tons of reinforcing bars and 2050 tons of shapes.

Concrete bar and shape awards during the week were light. Bids will be opened July 9 on 16,150 tons of steel sheet piling for the government dam at Fort Peck, Montana. Bids have been opened on 2213 tons of shapes for the

M street bridge over the Sacramento river at Sacramento, Calif., and on 750 tons for an auditorium at San Jose, Calif.

Pacific States Cast Iron Pipe Co. booked 280 tons of 2 to 14-inch pipe for Carlin, Nev. National Cast Iron Pipe Co. is low on 256 tons for Whittier, Calif.

Coulee Dam Letting Near

Seattle—Prompt decision is promised by government officials on awards for the Grand Coulee dam project. District offices have recommended the general contract to the low bidder, Silas Mason Co., New York, at $29,339,301.

This is the largest project in the history of the Pacific Northwest. The project requires the following: reinforcing, 12,500 tons; gates, 3139 tons; penstocks and bulkhead gates, 500 tons; butterfly valves, etc, 1261 tons; traveling and gantry cranes, 1150 tons; track rails, 102 tons; trash racks, 2121 tons; shapes for powerhouse, 800 tons; metal tubing, steel and cast iron pipe, 600 tons; metal floor plates, 91 tons.

Puget Construction Co., Seattle, is low at $304,755 for construction of the two state Deception Pass spans, 900 and 450 feet in length. The job requires 1580 tons of shapes and 162 tons of reinforcing steel. Wallace Bridge & Structural Steel Co., Seattle, will probably fabricate the shapes.

Tacoma, Wash., is about to call bids for a water system improvement to cost $1,000,000. The first unit will take 18,940 feet of 52 to 63-inch pipe, steel or concrete.

The jobbing trade continues in fair volume notwithstanding the transportation tieup. Scrap exporters are handicapped by inability to ship.

Iron Ore

Iron Ore Prices, Page 52

Cleveland—With final returns on Lake Superior iron ore shipments for June still being compiled late last week, the total for the month was indicated as approximately 4,400,000 tons. This compares with 2,630,000 tons in May, and 5,500,000 tons last September.

A strike of tugmen on the Great Lakes has tended to slow up the movement of iron ore vessels; as, for example, at Cleveland where boats have had to make a long trip up a narrow river, and after discharging their cargoes, back up to the lake. Longshoremen have been voting on a strike, which if it develops may prove a more serious impediment to lake freight transportation.

Steel in Europe

Foreign Steel Prices, Page 54

London — *(By Cable)* — Seasonal quiet prevails in the steel markets in Great Britain but the undertone is hopeful. Prices in the Midlands are unchanged, but Continental billets are selling at 5s below British. Demand for sheets is dull. The Scottish trade is quiet. Tin plate manufacturers are awaiting completion of an international agreement. British makers of wire rope are moving to form a cartel. Some increase in duties on steel are expected.

The Continent reports merchant bar exports are satisfactory, especially to the Near East, but other markets are dull.

Equipment

New York—Machinery orders in the district have declined, but the number of active inquiries continues to be an encouraging factor. Several of the larger industrial buyers who have inquired for machinery are slow to close, but in most instances are expected to do so eventually. Buying on the part of the navy continues active and a large list of equipment for New York city vocational schools is expected out shortly, this list covering a wide variety of tools.

Boston—New inquiry and buying has slumped, but a few shops in the New England district have fair backlogs for steady operations during the remainder of the month. Inquiry is well spread, but buying with few exceptions is for one or two tools at a time. All steelworks in the district, however, have improvements under way, including replacement of an open-hearth stack, a soaking pit and the installation of a bar mill.

Chicago—Improvements at steel plants remain largely of a miscellaneous nature. Rehabilitation work recently has consisted principally of necessary repairs, and plans for extensive replacements generally are held in abeyance, particularly in steelmaking divisions. Demand for mill rolls and ingot molds is lighter, reflecting the near future outlook in the industry. While railroads have continued light buyers of plant equipment, better business is expected to follow completion of the national survey of railroad shop facilities. The machine tool market continues quiet, with few large inquiries pending.

Pittsburgh—A foreign steelworks is reported to have placed orders for modernizing its sheet mill, including a new 2-high and a new 3-high rolling mill, with a steel mill equipment interest in the Pittsburgh district. Plans have proceeded no further on Carnegie Steel Co.'s continuous strip mill for Youngstown, O. Plans are believed nearly ready for bid for a large mill improvement on the part of an independent steelmaker in the Pittsburgh district with further details awaited.

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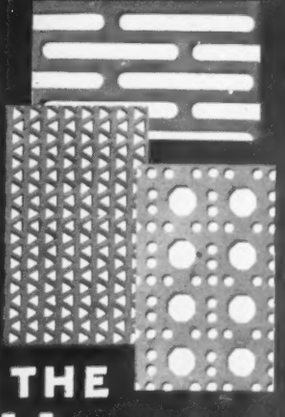

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Construction and Enterprise

New England

THOMASTON, CONN.—Eclipse Glass Co., care of H. Otto Vogt, Thomaston, Conn., plans to alter and construct brick addition to factory to North Main street. Carl V. Johnston, Newfield road, Torrington, Conn., is architect. Estimated cost $28,500.

BOSTON — International Automatic Coupling Inc. has been formed by Francis P. Rock, 15 Prince street, Jamaica Plain, Mass., to manufacture couplings and other metal products.

MIDDLEBORO, MASS. — American Oil Co., 31 St. James avenue, Boston, will build an oil storage plant, including steel tanks and pumps, to cost about $40,000.

NEWTON, MASS.—Bids will be taken July 29 by the public building commission, city hall, for an incinerator plant, including furnaces, stokers and conveying equipment. Entire cost estimated at about $200,000. Metcalf & Eddy, Statler building, Boston, are engineers.

REVERE, MASS.—Tidewater Oil Co., Bayonne, N. J., will build a bulk station here, including a 35 x 63-foot boiler house, to cost about $40,000.

WORCESTER, MASS.—American Oil Co., 31 St. James avenue, Boston, plans construction of a bulk oil storage plant here, including steel tanks and pumps, to cost about $40,000.

WARWICK, R. I.—New England Union Co. has been formed by Norman W. Norden and associates to manufacture pipe fittings.

New York

AUBURN, N. Y.—Auburn Machine & Tool Co. Inc. has been formed by Frederick E. Short, 20 Vista street, to manufacture tools and machinery.

BROOKLYN, N. Y.—Colonial Beacon Oil Co., 155 East Forty-fourth street, will take bids in August for an oil storage plant at Freeman and Provost streets, to cost about $125,000. C. L. Paul, at above address, is architect and engineer.

LACKAWANNA, N. Y.—Spring Perch Co. has awarded contract to McClintic-Marshall Corp., Bethlehem, Pa., for reconstruction of its plant recently destroyed by fire.

NEW ROCHELLE, N. Y.—Sound Auto Parts Corp. has been formed by Herman H. Bose, 165 Mount Joy place, to manufacture and repair automobile parts.

NEW YORK—R. & R. Lighting Products Inc. has been organized by James G. Harris, 90-04 161st street, Jamaica, N. Y., to manufacture lighting fixtures.

NEW YORK—Reynolds Metals Co. Inc., 19 Rector street, New York, has bought the former plant of the Edison Lamp Works Inc. at Harrison, N. J., from General Electric Co., and will improve and equip it for the manufacture of metal foils and metal products.

Pennsylvania

EASTON, PA.—Commonwealth of Pennsylvania, department of property and supplies, John L. Hanna, secretary, Harrisburg, Pa., is taking bids July 11 for garage, including offices, shop and heating plant. The shop is to be 60 x 66 feet.

UNIONTOWN, PA.—Uniontown Distilling Syndicate, M. E. Minert, manager, plans to recondition distillery here. Estimated cost exceeds $30,000.

New Jersey

GRASSELLI, N. J.—General Aniline Works is planning to erect a building. Bids were opened June 27 for 250 tons of reinforcing steel.

NEWARK, N. J.—Breeze Corporations Inc., 24 South Sixth street, manufasturer of stainless steel aircraft parts and similar products, has leased five acres at Newark airport and will build plant, including first unit, two stories, 60 x 400 feet, with hangar 125 x 150 feet. Production will be expanded to include complete airplanes. Investment estimated at $200,000. Frank Grad, Raymond boulevard, Newark, N. J., is architect.

Ohio

CLEVELAND — Cleveland Tunnel Boring Machine Co. has been incorporated by Wallace J. Baker, Williamson building, Public Square, I. J. Schryer and B. M. Van Winkle.

CINCINNATI—Ralya Saw Corp. has been formed by Paul Sipes, in care of Walter K. Sibbald, Chamber of Commerce building, Cincinnati, to manufacture saws and similar equipment.

CINCINNATI — United States engineer, 408 Customhouse, Cincinnati, will receive bids July 3 for portable air compressor, driven by gasoline engine through friction clutch and mounted on trailer; list 34/105.

DAYTON, O.—Inland Mfg. Co., 15 Coleman street, plans to build a 2-story addition 150 x 400 feet for production of automotive and refrigeration parts. Cost estimated at $325,000. W. S. Whittaker is president and general manager. (Noted June 25.)

LIMA, O.—Relay Motors Corp. manufacturer of automotive parts, has been bought at receiver's sale by E. F. Harsch and J. G. Wray, Warsaw, Ind., who plan to reorganize and resume operations.

TROY, O.—Hobart Mfg. Co. has acquired the domestic scale division of the International Business Machines Corp. and is planning to expand its facilities.

Michigan

BAY CITY, MICH.—Gulf Refining Co., Seventh and Grant streets, Pittsburgh, will take bids soon on a storage and bulk oil plant to cost about $225,000.

ELSIE, MICH.—R. W. and M. Lewis, Ovid, Mich., plan construction of an oil refinery at Elsie, Mich., to cost over $60,000.

Illinois

BLOOMINGTON, ILL.—Hayes Custer Stove Co., manufacturers of stoves and ranges, is building a 1-story addition.

CHICAGO—Master Parts Mfg. Co., 183 South Dearborn street, has been organized to manufacture automotive parts, by Nathan Remington and associates.

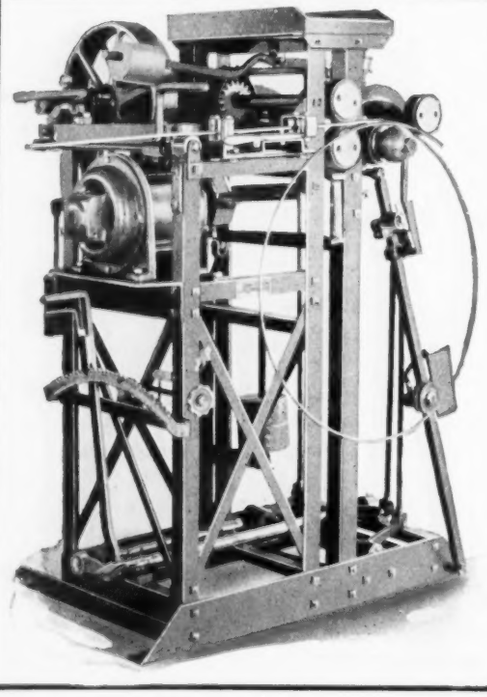
CHICAGO—Keen I Sales Corp., 162 North Desplaines street, has been formed by Frank Bauerle, V. Jascotte and A. Platter, to deal in metals. Correspondent: Fisher & McGraw, 33 North LaSalle street, Chicago.

CHICAGO—New Method File Grinding Co., 609 West Fulton street, has been incorporated by Fred R. Ward, Harry H. Bartlett and George W. Ford, to manufacture cutting tools and grinding files. Correspondent: Daniel L. Madden, 1608 Conway building, Chicago.

CHICAGO—Krag-Martin Corp., 319 North Albany avenue, has been incorporated by Franz K. Krag, George M. Martin and Erik L. Krag, to conduct and operate machine shops. Correspondent: Nathan Haffenberg, 100 West Monroe street, Chicago.

CHICAGO—Inland Mfg. Co., 1120 North Cicero avenue, has been incorporated by William J. Masoner, Samuel H. Fleischer and J. Devoto, to deal in steel, iron and other metals. Correspondent: Heile, Cavender, Gilchrist & Kaiser, Purnham building, Chicago.

SYCAMORE, ILL.—Plant of the Miles Equipment Co., makers of axles and



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Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

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Kardong Bros., 346 Buchanan St., Minneapolis, Minn.

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American Bridge Co., Frick Bldg., Pittsburgh, Pa.
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BARRELS (Plating)
Udylite Process Co., 3953 Bellevue Ave., Detroit, Mich.

BARS (Alloy)
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
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Bantam Ball Bearing Co., The South Bend, Ind.
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Shenango-Penn Mold Co., Dover, O.

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Bantam Ball Bearing Co., The, South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Hyatt, Roller Bearing Co., P. O. Box 476, Newark, N. J.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
Timken Roller Bearing Co., The, Canton, O.

BEARINGS (Roller)
Bantam Ball Bearing Co., The, South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Hyatt Roller Bearing Co., P. O. Box 476, Newark, N. J.
Timken Roller Bearing Co., The, Canton, O.

BEARINGS (Roll Neck)
Bantam Ball Bearing Co., South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Hyatt Roller Bearing Co., P. O. Box 476, Newark, N. J.
Ryerson, Jos. T. & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Timken Roller Bearing Co., Canton, O.

BEARINGS (Thrust)
Bantam Ball Bearing Co., The, South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Timken Roller Bearing Co., The, Canton, O.

BENDING AND STRAIGHTENING MACHINES
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Morgan Engineering Co., The, Alliance, O.
Thomas Spacing Machine Co., Pittsburgh, Pa.

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Koppers Construction Co., 1438 Koppers Bldg., Pittsburgh.
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BILLETS (Alloy and Carbon Steel)
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Andrews Steel Co., Newport, Ky.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. La Salle St., Chicago, Ill.
Republic Steel Corp., Youngstown, O.
Timken Steel & Tube Co., Canton, O.
Washburn Wire Co., Phillipsdale, R. I.

BILLETS (Forging)
Alan Wood Steel Co., Conshohocken, Pa.
Andrews Steel Co., Newport, Ky.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. La Salle St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
Republic Steel Corp., Youngstown, O.
Standard Steel Works, Co., Burnham, Pa.
Timken Steel & Tube Co., Canton, O.

BILLETS AND BLOOMS
Alan Wood Steel Co., Conshohocken, Pa.
Andrews Steel Co., Newport, Ky.
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. La Salle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Republic Steel Corp., Youngstown, O.
Standard Steel Works Co., Burnham, Pa.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.
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Sturtevant, B. F., & Co., Hyde Park, Boston, Mass.

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Bethlehem Steel Co., Bethlehem, Pa.

BOILER TUBES—See TUBES (Boiler)

BOILERS
Murray Iron Works Co., Burlington, Iowa.

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Bethlehem Steel Co., Bethlehem, Pa.
Illinois Steel Co., 208 S. La Salle St., Chicago, Ill.
Jones & Laughlin Steel Co., Jones & Laughlin Bldg., Pittsburgh, Pa.
Oliver Iron & Steel Corp., S. 10th & Muriel Sts., Pittsburgh, Pa.
Republic Steel Corp., Upson Nut Div. 1912 Scranton Rd., Cleveland, O.
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Strong, Carlisle & Hammond Co., The, 1400 W. 3rd St., Cleveland, O.

BOXES (Open Hearth Charging)
Morgan Engineering Co., The, Alliance, O.
Wellman Engineering Co., 7000 Central Ave., Cleveland, O.

auto parts, recently was destroyed by fire.

District of Columbia

WASHINGTON—Procurement division, public works branch, will receive bids July 18 for boilers for post office at Charleston, S. C.

WASHINGTON—Bureau of supplies and accounts, navy department, will open bids July 13, schedule 2810, for castings for casings and turbines; July 17, schedule 2821, for chain hoists; July 13, schedule 2825, for steel forgings for shafting, delivery Brooklyn, N. Y., and Philadelphia; July 17, schedule 2833, for corrosion-resisting steel castings.

Florida

DELAND, FLA.—City Commission, G. A. Dreka, chairman, plans light and power plant.

Kentucky

AUBURN, KY.—City receives bids July 9 for waterworks system, including construction of filtration plant of 200,000-gallon capacity, and elevated tank of 60,000-gallon capacity. Approximate cost $43,000. Robert & Co. Inc., Atlanta, Ga., engineer and architect.

LOUISVILLE, KY.—United States Engineer, P. O. Box 59, Louisville, will receive bids July 24 for 1600-horsepower diesel engine for dredge pump.

WINCHESTER, KY. — Bluegrass Brewery, R. Brooks Taylor, president, is planning to construct plant with capacity of 100,000 barrels.

Louisiana

NEW ORLEANS—Southern Syrup Co., Hugh K. Smith, manager, 314 Girod street, is receiving bids for boilers, dynamos, piping, pumps and sheet metal work in connection with operation of syrup plant. Equitable Equipment Co., New Orleans, has contract for tanks.

Maryland

BALTIMORE—William Schluderberg-T. J. Kurdle Co., Baltimore and Eaton streets, has acquired an acre lot adjoining two acre tract, purchased recently, for expansion of canning and packing plant.

North Carolina

CHARLOTTE, N. C.—Atlas Foundry Co. has been formed with capital of $10,000 by E. Frohman, 1361 East Morehead, and L. J. Nolen.

Mississippi

LAUREL, MISS.—Board of commissioners will receive bids July 23 for constructing power plant and electric light distributing system to cost $400,000. Also, will receive bids July 23 for constructing partial power and light plant in connection with city waterworks to cost $163,000. J. M. Williams, city clerk.

MAGNOLIA, MISS.—Board of alderman will receive bids July 16 for auxiliary pumping station improvements, consisting of constructing complete pumping station building, furnishing and installing 60-horsepower diesel oil engine complete with all accessories. Henry A. Hentz & Co., Hammond, La., engineers.

OXFORD, MISS.—Board of trustees, institutions of higher learning, will open bids July 7 for construction and installation of one 150,000-gallon reservoir, including aerating and filtering system at University of Mississippi.

South Carolina

HARTSVILLE, S. C.—City has been allotted $40,500 for water and sewerage system.

PENDLETON, S. C.—City has $51,500 allotments for waterworks.

Tennessee

KNOXVILLE, TENN.—City receives bids July 17 for furnishing material for complete electric distribution system to cost $600,000. W. W. Wynatt, city manager.

NASHVILLE, TENN.—PWA has allotted $3,940,000 for public construction, including waterworks extension.

West Virginia

CHARLESTON, W. VA. — Appalachian Electric Power Co., W. F. Ficklen, manager, is planning to proceed with construction of dam on New river in Virginia.

Missouri

WALDRON, MO.—McCormick Mercantile & Distillery Co., S. McCormick, president, is planning to construct two-story distillery, to cost approximately $30,000.

Arkansas

CARLISLE, ARK.—D. Hogan, 5323 Edgewood street, Little Rock, Ark., has contract at $51,555 for constructing complete waterworks.

LESLIE, ARK.—Mays Mfg. Co. has been incorporated with $10,000 capital by W. S. Mays and G. W. Mays, to operate woodworking plant.

MOUNT IDA, ARK.—Freeman Edwards, mayor, will receive bids July 5 for furnishing tools, equipment and materials for constructing complete waterworks system, including pumps, motors and elevated tank. F. A. Pritchett, engineer, 701 Wallace building, Little Rock, Ark.

Oklahoma

OKLAHOMA CITY, OKLA.—Western Steel & Wire Co. has been organized by J. W. Morris Jr., 409 Equity building.

OKMULGEE, OKLA.—Superior Pipe & Supply Co. has been incorporated with capital of $15,000 by Joseph Rosenbloom, president.

TULSA, OKLA.—Leonard Mfg. Co. has leased a shop building at 3428 South Santa Fe street and installed a machine shop for manufacture and repair of oil field equipment. P. G. Leonard is owner and manager.

Texas

AUSTIN, TEX.—City, Guiton Morgan, city manager, has voted $857,000 bonds to cover PWA loan for installation of power plant, waterworks and sewer system improvements.

BIG SPRING, TEX.—Great West Pipe & Supply Co. has been incorporated by G. A. Woodward.

HOUSTON, TEX.—Well Equipment Corp. has been incorporated by Charles H. Lane and S. W. Robinson, to operate foundry and machine shop.

HOUSTON, TEX.—Harris County Brick Co. has had plans prepared by E. H. Stubee, architect and engineer, Houston, for two-story brick manufacturing plant, to cost about $30,000.

Wisconsin

MILWAUKEE—LeRoi Co., 1706 South Sixty-eighth street, has received government order for 75 gas-engine-driven 5 kilowatt generators for lighting C. C. C. camps, and three 100-kilowatt generators for navy cranes at the repair base in Pearl Harbor, Hawaii.

MILWAUKEE—Twin-Flex Co., Detroit, manufacturer of third-axle auxiliary units for Ford and Chevrolet motor trucks, has taken over a factory at 2161 South Fifty-fourth street, Milwaukee, and is moving its plant and offices to Milwaukee. Capacity is thereby increased more than 100 per cent.

RACINE, WIS.—Hexcel Radiator Co., 277 East Erie street, Milwaukee, maker of automobile and truck radiators, space heaters, etc., has bid in a large factory unit of the defunct Ajax Rubber Co. here and plans to move the Milwaukee plant here about Jan. 1.

WAUSAU, WIS.—Minnesota Mining & Mfg. Co., L. A. Hatch, local manager, will build a plant here. General contract has been let to W. Murphy & Son, 1607 Pioneer building, St. Paul.

Minnesota

VIRGINIA, MINN.—City plans construction of a water filtration plant to cost about $80,000.

Nebraska

LINCOLN, NEBR.—Bids have been rejected for a municipal manganese removal plant, including building, pumps and filter. Plans are being revised and new bids will be asked. Cost estimated at about $200,000. Black & Veatch, Mutual building, Kansas City, Mo., are consulting engineers.

New Mexico

DEMING, N. MEX.—Mimbres Valley Distillery Co. has plans for construction of 40 x 100 foot distillery, and will be in market for new machinery.

Pacific Coast

LOS ANGELES—University of California has opened bids for construction of chemistry building.

LOS ANGELES—Rio Grande Oil Co., 417 South Hill street, plans construction of new refining plant in the eastern portion of South Gate, Calif. Estimated cost $28,500.

PORTLAND, OREG.—Plans have been completed for a two-story concrete construction factory building, 52 x 100 feet, for Henry Harris, at Yamhill and Water streets.

ONTARIO, OREG.—Bureau of reclamation will open bids July 12 for earthwork, structures, tunnels, etc., of the Mitchell Butte division, Owyhee project in Oregon and Idaho. Contract involves 40 tons of reinforcing steels, installing gates, hoists and miscellaneous metal work.

Dominion of Canada

FORT ERIE, ONT.—Town plans building a pumping station on Gilmore road. M. T. Gray is town engineer.